

What follows is detailed technical information supported by a decade of investigation into the origin of the AME in Canada and elsewhere however the focus of this document is directed at Canadian AME licensing since 1920.

The findings are covered in this report and are supported by factual information vetted by a peer group that includes senior AMEs who were responsible for ensuring the AME license was retained by TC in the 1980's and who fought long and hard to ensure that AMEs would remain "Engineers".

This report covers a 100+ year timeline of events on AMEs prior to 1970 and as far back as WW1 can be obtained which is supported by legislative documentation, reports published by the Parliament of Canada (or required to be produced by the Parliament of Canada) and includes providing the reader with links to where some of that factual information can be reviewed and downloaded.

While not everyone will agree with this report, it's contents are factual and should be understood by the reader as an area of AME history that needs to be brought into the light as a part of Canadian Aviation that is unrecognised and un-taught.

The information contained herein identifies a long-term degradation to Canada's "Private Sector Civil Aviation Safety Inspectors" - the "AMEs" and as such presents a very real and serious threat to Civil Aviation Safety. With that realisation in the forefront the contents of this report was communicated to the Prime Minister of Canada and his Canadian Ministers of:

Transport, Justice, Public Safety and numerous other Members of Parliament.

It has also been presented to the Governor General, the Transportation Safety Board, the Office of the Inspector General and Canada's Director General of Civil Aviation.

A formal Committee of Enquiry was asked to be convened to review and consider the now identified safety flaw.

Steve Chamberlain, L-AME

29 April 2022

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Background on the need for the AME

The person responsible for seeing that the wishes of Parliament in accordance with the Aeronautics Act are carried out today is the Minister of Transport. Canadian Legislation requires that the Minister shall be satisfied that the design and construction of all Canadian registered civil aircraft or aeronautical product holding a Canadian Certificate of Airworthiness or a Canadian validation of a foreign certificate are airworthy, and that after they have been put into service, they shall be maintained in an airworthy condition.

It is obvious, that although this is a general statement of what the Minister must accomplish, it must be interpreted in accordance with practical possibilities.

The Hon. Minister cannot be expected to "personally" examine or maintain every single aircraft for airworthiness and therefore, the Hon Minister must either employ assistants to do it for them or must delegate their Inspection duties to suitable competent persons, and the Hon minister cannot, even with the assistance of these, be responsible for the airworthiness of all aircraft on the Canadian Register all the time.

The distribution of registered aircraft operating throughout Canada and the world means that if the required certifications were to be made without undue delay, it would be necessary for the Minister to:

- A. supply either sufficient Transport Canada (internal) inspectors at the location of each and every aircraft and aeronautical product undergoing maintenance for this purpose, or
- B. for the Minister to delegate the duty of inspecting for condition and conformity of aircraft subsequent to maintenance to suitable other "competent persons" who are present whenever that work is being undertaken.

The logical solution in respect of "Private industry" was to make provisions to further educate, train and enable certain of the Aircraft Mechanics (AM's) already certified competent to perform trade's-work - by providing them with/requiring them to obtain "higher education in the legislation, standards, design specifications etc related to airworthiness" in order for them to be able to subsequently supervise trades' persons, inspect aircraft and other aeronautical products for condition and conformity and to finally certify by their hand not only their own work, but also that of others - once tested and licensed by Government to act in the intended capacity.

Additionally, these license holders were to also accomplish the role of Government Notary by certifying the accuracy of details recorded in work documents and technical records by attesting that the details recorded by the trades-person was in compliance with the stated Requirements and Regulations pertaining to Airworthiness.

What is now know about Canadian AMEs

There is no change today from the original requirements of the Air Engineer licensing structure laid down in 1919/1920 to accomplish Airworthiness Inspections and Certify aircraft and aeronautical products on behalf of the Government of Canada to that of today's AMEs.

What is largely unknown and unrecognised by the majority of the populace - including the Minister's own staff - is that the Canadian AME License of today originated in the UK in 1919.

Canada's Privately Licensed Aviation Safety Inspectors, her Licensed AMEs, have from the initial publication of the Canadian Air Regulations, 1920 in which their position as "Air Engineers" was formally introduced and announced publicly, been licensed to accomplish the delegated role of Government's "Airworthiness Inspection Representative" and tasked with accomplishing on-site supervision, inspection and certification of aircraft and aeronautical products being manufactured and maintained in Canada.

They are tasked with this role and responsibility to ensure that the Aeronautics Act and supporting Regulations are complied with because the Honourable Minister, and the Minister's internal staff, are unable to be everywhere Canadian aircraft are being designed, manufactured or maintained at the exact same moment in time.

In 1914, Parliament of Canada passed statute law known as "The War Measures Act, 1914" an Act delegating the legislative authority of Parliament to Cabinet, thus empowering the Governor in Council to:

1. Proclaim a state of "real or apprehended war, invasion or insurrection" and to
2. make from time to time such orders and regulations, as he may by reason of the existence of real or apprehended war, invasion or insurrection, deem necessary or advisable for the security, defence, peace, order and welfare of Canada.

In England, the exact same thing occurred, the British Parliament passed statute law known as "The Defense of the Realm Act" an Act delegating the legislative authority of Parliament to the Crown, thus empowering the King to:

1. Proclaim a state of "real or apprehended war, invasion or insurrection" and to
2. make from time to time such orders and regulations, as he may by reason of the existence of real or apprehended war, invasion or insurrection, deem necessary or advisable for the security, defence, peace, order and welfare of the British Empire.

In Canada the *Air Board Act* was assented to 6th of June, 1919 - prior to the official end of WW1 and a return to Peace and normal peace-time Parliamentary Process but it was the beginning of the Canadian Government taking responsibility for the airworthiness of civil aircraft within Canada.

The *Air Board Act* required an existing treaty to give validity to legislation, not merely a prospective convention and the Canadian system of government is British and conducted in the name of the Monarch. By way of the BNA Act, the British Monarch rules Canada through the Governor General. An important point within Canadian law is that what was already in place under British law is regarded as "having existed previously to give validation to Canadian legislation" for the purpose of this document that "previously existent British legislation" is the Aeronautics Act, 1911 as amended

An important question regarding Canadian Aeronautics Legislation is thus:

Was there pre-existing legislation respecting aeronautics that Canada - thru British law - already adhered to or recognised - that existed or was referenced for Canadian legal purposes *prior to 1919*? The answer, is yes, there was, the British Aeronautics Act of 1911 entitled "An Act for the Protection of the Public from the Dangers arising from Aerial navigation" which is referred to repeatedly by Canadian businesses taking out licenses with the Government of Canada under the "Companies Act" and published in the Canada Gazette.

It was decided at the very outset of civil aviation regulation in Canada to license specific of the Air Mechanics willing to voluntarily accept a delegated authority to perform supervisory, inspection and certification duties, subject to very specific qualifications prescribed for attaining the licence being met, and on the recommendation of the Government's A.I.D., engineers became "licence holders" and thus "Airworthiness inspectors/certifiers" acting on behalf of the government. (see memoirs of A.V.M Ernest W. Stedman, Director - Technical Branch, Canadian Air Board). In Canada these licence holders were formally recorded and documented within the Air Regulations, 1920 to be known as "Air Engineers".

Air Ministry "Aeronautical Ground Engineer" to Air Board "Air Engineer"

What was not documented within the Canadian Air Regulations, 1920 for all to know and understand was that the Canadian Air Board directly copied the pre-existing British legislation pertaining to Licensing of Aeronautical Ground Engineers (simply "Ground Engineers") because that was the license required to be held by Canadians in order to issue daily certificates of Airworthiness to, and to oversee and certify the repairs and overhauls of - all of the "G Registered" British aircraft in Canada.

All of the details and requirements for the AME of today stems from the British Air Navigation Order, Aeronautics Act , Air Navigation Directs and British Ground Engineer Licensing policy, process, standards and requirements of 1919.

In the years between 1916 and 1919 the Governor General of Canada, as Crown Representative, and others, identified to Parliament the supreme importance for Canada to understand and recognise that "Civilian Aviation" would be an issue of concern post WW1.

Subsequently thru various Orders-in Council the Governor General introduced information to the Canadian public respecting aircraft, aeronautics, British Imperial law as well as English Law thru Parliament which culminated in the Air Board Act.

Subsequently, certain of the Governor Generals' Crown Roles and Duties respecting the control of Canadian aircraft Airworthiness and licensing of Airworthiness Inspection Representatives (A.I.Rs) in Civil Aviation in Canada were delegated to the Air Board. The Air Board assumed the "responsibility in Canada to examine applicants for Ground Engineer's Licences" and subsequently the Air Board issued Canadian Air Engineers' Licenses to those candidates who passed. The "Authority for the Ground Engineer's license" however was not passed to the Canadian Air Board as it remained vested in the Crown.

From 1920 the Department of National Defense was tasked by the Air Board with examining potential candidates for, and issuing Licenses to, those applicants who were successful, however neither the Canadian Air Board or the DND were delegated the authority for the Air Engineer's license.

Authority for the Airworthiness Inspector's delegation and license still did not transfer to the DND and was retained within the control of its original issuer - the Crown.

It is well documented that the Air Board Act was superseded by the Aeronautics Act, R.S.C, 1927 c. 3 of Canada under proclamation, and came into force and have affect as law on, from and after the first day of February, 1928. What is not stated though is that the requirements and responsibility for the airworthiness of civil aircraft and aeronautical products within Canada, including the Licenses and Certificates previously created and issued under the Air Board Act - were retained within the Aeronautics Act, 1927 as being crucial to the control of Civil Aviation in Canada.

Certificate of Airworthiness depends on AME's Inspection and release authority

Today that Authority and responsibility is vested in the Governor General in Council, and written into the current Aeronautics Act sections 4.3 , 7.1 and 7.1.1(b) of the Act in order for the Minister to delegate in order to accomplish airworthiness inspections for control of documents relating to Canadian Aircraft and aeronautical product airworthiness, and to suspend, rescind or revoke an airworthiness authorisation issued by the Minister where public safety is identified by those inspections as being threatened or imperilled; or, to be able to delegate those duties and responsibilities to others acting on the Minister's behalf.

The "releases and certificates" issued (written into the logbook etc.) and Signed by AMEs are "Certificates and documents attesting to the Airworthiness and Safety of Canadian Aircraft and Aeronautical Products as delegated representatives of the Minister. Even when signed by a person employed in an AMO or by a person employed by the holder of an AOC, they are still issued "on behalf of the Minister". Aircraft Manufacturers, AMOs and Air Operators are required to employ persons "Certifying Staff" who hold this delegated authority be they licensed AMEs or not, and it is upon those persons' delegations that the business operates. When accomplishing "inspections" and subsequently notarising "signing" those certificates and releases the delegate is a Minister's representative and must not be interfered, hindered, or distracted in that role and purpose.

Aeronautics Act Sections effecting the AME and controlling the AMEs ability to act as a delegate:

4.3 (1) **Delegation by Minister**: *The Minister may authorize any person or class of persons to exercise or perform, subject to any restrictions or conditions that the Minister may specify, any of the powers, duties or functions of the Minister under this Part, **other than the power to make** [...]*

7 (1) **Suspension where immediate threat to aviation safety or security**: If the Minister decides to suspend a Canadian aviation document ***on the grounds that an immediate threat to aviation safety or security exists or is likely to occur as a result of an act or thing that was or is being done under the authority of the document or that is proposed to be done under the authority of the document,*** [...]

7.1(1) **Suspension, etc., on other grounds**: If the Minister decides ***to suspend, cancel or refuse to renew a Canadian aviation document*** on the grounds that (b) the holder or any aircraft, airport or other facility ***in respect of which the document was issued ceases to meet the qualifications necessary for the issuance of the document or to fulfil the conditions subject to which the document was issued*** [...]

CAR Part V - Sections effecting the AME and the AMEs ability to act as a delegate:

Subpart 7 — Flight Authority and Certificate of Noise Compliance

507.10 - Persons Who May Attest to Condition and Conformity

Subpart 9 — Export Airworthiness Certificates

509.04 - Persons Who May Attest to Condition and Conformity

Subpart 21 — Approval of the Type Design or a Change to the Type Design of an Aeronautical Product

521.33 - Conformity with Certification Basis

Subpart 21 - Division III — Canadian Technical Standard Order (CAN-TSO) Design Approvals

521.107 - Conformity with Certification Basis

Subpart 21 - Division IV — Changes to a Type Design

521.160 - Conformity with Certification Basis

Subpart 21 Division V — Supplemental Type Certificates

521.205 - Conformity with Certification Basis

Subpart 61 — Manufacture of Aeronautical Products

561.10 - Statement of Conformity

Subpart 71 — Aircraft Maintenance Requirements

571.10 - Maintenance Release

571.11 - Persons Who May Sign a Maintenance Release

SCHEDULE II - Specialized Maintenance > 573.01 - Subpart 73 — Approved Maintenance Organizations > 573.05 - Authorization to Sign a Maintenance Release

Interference with AMEs acting on Minister's behalf

Many groups and individuals who:

1. do not want to comply with legislation that requires aircraft to be airworthy and safe because airworthiness and safety impact their bottom line and so they continually try to persuade the Public and numerous Ministers in the Canadian Parliament ,including the Minister of Transport, that the "AME is only a mechanic and not a Minister's Representative".
2. "think they know better" than the Minister and Parliament what an airworthy and safe aircraft is and for many decades they have quietly but continually persuaded the Public and numerous Ministers in the Canadian Parliament ,including the Minister of Transport, that the "AME is only a mechanic and not a Minister's Representative".

In doing so those groups and individuals have systematically undermined:

1. Crown Orders,
2. the Governor General's Orders-In-Council
3. the Parliament of Canada,
4. the Air Regulations and
5. the Aeronautics Act

Which has imperilled "Aviation Safety" with the direct result of the Air Engineers / AMEs being slowly de-educated over many to the point where they are no longer effective to fulfil their intended role.

Change from Ground Engineer to Air Engineer to Aircraft Maintenance Engineer

Although the original term for the delegated Airworthiness Inspection Representative in the root legislation was "Ground Engineer" - a term recognised by the Canadian Government, the Canadian Air Board instead used the term Air Engineer" - "Air" being an acronym which accurately reflected the role of the License holder .

It is now known that the Minister's delegated Airworthiness Inspection Representative AME in Canada is directly linked to the British "Ground Engineer" - and what has been uncovered regarding the "Ground Engineer" is that in 1945 it was considered that the term "Ground Engineer", as applied to an "Inspector of aircraft" to be "misleading".

"The title, although an acronym in lower case, was not clearly defined / specified within the Aeronautics Act and gave no indication of the serious work on which the licence holder might be engaged.

It was recommended that licence holders should in future be known as "Licensed Aircraft Engineers" (L.A.E's) and that the word "Maintenance" (M) was inserted within the designation "Licensed Aircraft Engineer" (L.A.E) to distinguish it a unique licence issued to L.A.E's and completely separate from the license held by an "Aircraft Operational Engineer", better known as a Flight Engineer. "

This recommendation was accepted by the British Government, and in March, 1946, the terms "Licensed Aircraft Maintenance Engineer" and "Licensed AME" was introduced within British Law.

Canada, recognising and following the changes being made to the license issued to British Airworthiness Inspection Representatives adopted the British terminology and changed the term for Canada's Airworthiness Inspection Representatives away from "Air Engineer" to Aircraft Maintenance Engineer. This change in terminology away from what was a completely "accurate term" for Canada's "Airworthiness Inspection Representative - Air Engineer" is reflected within the Canada Gazette and other Government publications of the day with the introduction of the AME-M in Canada.

Factual Evidence on AME Origin not formerly revealed

What is now known and documented, is that the Canadian "Air Engineer's License" does indeed stem from Crown Orders of George V. issued during WW1 and brought into Civilian law by the passing of the Aeronautics Act, 1919 by the UK Parliament in Westminster, England on 27 February 1919.

That British Parliamentary Act amended and superseding all prior British Parliamentary Acts which stemmed from the passing of a 1911 Bill tabled by then Home Secretary Winston Churchill titled "An Act to provide for the Protection of the Public from the Dangers arising from Aerial Navigation" with a short title of "the Aerial Navigation Act, 1911".

<https://archive.org/details/UnitedKingdomParliamentBILL230AerialNavigationAct1911Pg1Of2>

Historical records within the Canada Gazette reflect that in Canada, private companies sought and were awarded licenses by the Canadian Government to build, operate, maintain etc aeroplanes in accordance with that act subsequent to the passing of *the (British) Aerial Navigation Act, 1911*.

At the time WW1 started, the British "Aeronautics Act, 1913" had superseded the original "Aerial Navigation Act, 1911" and was further amended to control and restrict aviation within Britain, the United Kingdom and the British Empire during the war.

An important point to note here is that "The Defense of the Realm Act" (DORA) allowed for George V., as Commander in Chief of the "Forces of the Empire" to have control over the British Empire as a whole and the British parliament subsequently transferred their powers to the King until the war ended.

In Canada, it was during the period of the DORA still in force during the cooling off period subsequent to the 1918 Armistice that George V. in Council issued Orders" that resulted in the creation of a "new Class of Officer" - an officer of the crown tasked with responsible for the safety of Aircraft and the inspection and certification of Aircraft.

In England that "New Officer of the Crown" was officially termed an "Aeronautical Ground Engineer".

Subsequent to the Order from the Crown, the British Parliament passed the Aeronautics Act, 1919 on 27 February 1919 thus moving the "Aerial (air) Navigation Order" and the position and role of the "new crown Officer" from being a Royal Order into Parliamentary legislation - Civilian Law.

However until "Peace was restored in 1920" the Aeronautics Act, 1919 could not be used by the Civilian population. This Parliamentary Act occurring 8 months prior to the ratification of the International Convention on Aerial Navigation (I.C.A.N) in Paris.

Subsequently, "Air Regulations" were identified as being needed in order to allow the passage of Military Control of Aeronautics into the Civilian world to support the Parliamentary Act of 27 Feb 1919 and further define the requirements of the Order and Act into something useable to support legislation and allow "Civil Aviation within the British Empire to resume" until "Peace was officially declared in 1920".

It was not until the official end of WW1 in 1920 that the Civilian Parliaments of the Empire could once again officially resume - a very important point to recognise.

The British "Air Regulations, 1919" were officially issued by the Secretary of State for Air (one of the Kings' Privy Councillors) on 29 April 1919 and published in the London Gazette whilst the D.O.R.A was still in effect. Some 6 months later the ratification of the International Convention on Aerial Navigation (I.C.A.N) in Paris, which formed part of the Paris Peace talks. As such, the British

1. Air Navigation Order,
2. Aeronautics Act, and
3. Air Regulations

existed in civilian law PRIOR to the ratification of the I.C.A.N (also called the Convention on Aerial Navigation or Convention sur la navigation aérienne "C.N.A")

The preamble of the British "Air Regulations, 1919" identifies that the Regulations, 1919 "carry the same weight as an Act of Parliament" and within those regulations we find information identifying that Aircraft are to be inspected for Airworthiness and Certified as Airworthy prior to flight. The New Crown Officer responsible to perform that inspection? An "Aeronautical Ground Engineer", simply termed "Ground Engineer".

In support of the

1. Air Navigation Order
2. Aeronautics Act, and
3. Air Regulations,

the British Air Ministry - which oversaw both service and civil aviation - issued what are known as "Air Navigation Directions" (A.N.D) which further defined the requirements that the civilian population and private enterprises would need to follow to support aviation legislation. The Air Ministry also issued "Air (Ministry) Publications" (A.P), Research Material (R.M) and "Memoranda" that further structured aviation and aeronautics specifications, instructions, standards, white papers, blue papers, pink papers etc

This resulted in a very well defined structure of Aviation and Aeronautics regulation and control from the highest level of law to the lowest level of minutia as follows:

1. Air Navigation Order
2. Aeronautics Act,
3. Air Regulations,
4. Air Navigation Directions, i.e A.N.D #1, sections 3 & 4
5. Air Publications, i.e A.P 1208 Vol I & Vol II
6. etc.

A link to the British Air Regulations, 1919 can be found here:

<https://archive.org/details/LondonGazetteApril1919>

When the Civilian Parliaments of the UK resumed in 1920 they passed a new "Aeronautics Act, 1920" which cancelled and superseded all previous Acts, but there was one stipulation in the Aeronautics Act, 1920 that many people in the civilian population of the British Empire - of which Canada was part - either overlooked or chose to ignore.

The stipulation - clearly stated - **was that all licenses and certificates previously issued were retained and incorporated within the new legislation.**

In this regard, the "Aeronautical Ground Engineer's" as originally created and their authority, role and capacity to serve as Delegates of the Crown transferred unmolested from Military Law and the 1919 Regulations for Civil Aviation into the new Civilian legislation of 1920.

Subsequent to the passing of the "Aeronautics Act, 1920" in England, all of the Parliaments of the Dominions of the British Empire passed their own "Aeronautics Act, 1920" except for Canada.

Canada retained the Air Board ACT of 1919 but issued "Civilian "Air Regulations, 1920".

A copy of the Canadian Air Regulations, 1920 can be found here:

<https://archive.org/details/AirRegulationsCanada1920>

What is important to take note of when reading Canada's Civilian "Air Regulations, 1920" is that the document is collection of "existing" and "New" material.

This raises the question : **If the Canadian Air Regulations, 1920 were being presented to the Public as an "entirely New Document" then there should be no need to specify "New" beside anything within the Regulations.**

Why the differences in Wording in the Air Regulations,1920?

What most likely occurred is that the Canadian Air Board took an existing "Regulation" document (RAF regulations for RAF training Stations in Canada) and altered it to include the new Post-War "Civilian" material referenced on the cover.

Why is all of this background on "British stuff" pertinent to Canada?

Because Canadian law stems from British Law and the background of the Air Regulations, 1920 stems from existing "Air Law" which was already recognised or present in Canada.

Additionally by way of the Regulations issued to the "RAF in Canada" by the British Air Ministry during the period April - November, 1918 which also complied with the British Legislation stemming from the 1911 Aeronautics Act and subsequent British Acts, Orders and Regulations pertaining to control of aeronautics for Service aircraft designed, maintained and operated by the RAF, RNAS and later RAF.

Taken upon the balance of probabilities, those pre-existing "WW1 Regulations" for the RFC/RAF in Canada" were amended and updated by way of "copy & paste" by the Canadian Air Board to include the "new Civilian requirements" required not only under existing British law, but also to comply with the international rules for flying and trans-border operations set down by the Convention to the Paris Peace treaty and then issued by the Canadian Air Board.

International Convention For The Regulation Of Aerial Navigation (ICAN):

<https://archive.org/details/internationalconventionfortheregulationofaerialnavigationsignedatparis13october1919cmd1609>

Convention internationale pour la réglementation de la navigation aérienne (CNA):

https://archive.org/details/internationalconventionfortheregulationofaerialnavigationsignedatparis13october1919cmd1609_202001

Deviation of terms from British to Canadian use

The Canadian Air Board appears to have altered the British terminology for "Airworthiness Inspection Representatives" (AIR's) either mistakenly or on purpose and that alteration by the Canadian Air Board has given rise to a 100+ year confusion which must be corrected.

A source of information detailing how the Air Board executive and staff may have been influenced to do what it did are the "Minutes of the of Meeting of Delegates of the Canadian Air Board and the Provincial Executive Committees of the Canadian Air Force Association" which took place at the Royal Alexandra Hotel in Winnipeg on July 3rd, 1920. The minutes of that meeting can be found here:

https://archive.org/details/Binder1_20170617/mode/2up

The "Canadian Air Force Association" (CAF) was a private company headquartered in Montreal which held a Federal business license but was not a Canadian Government department or agency entity and is correctly identified as being "the Canadian Association of Retirees of the RFC/RNAS and RAF.

Canadian Orders in Council and Aeronautics

Minister Alghabra, in 1918-1919 Canada had delegates attending the Paris Peace conference, and in fact the Prime Minister was fully aware of the discussions taking place regarding the I.C.A.N as were others in Canada. The Canadian Dept. of External Affairs published "Documents on Canadian External Relations" contain many memos, telegrams and responses to and from the P.M and others regarding the concerns over "Aeronautics". Canadians serving in the RAF piloted many aircraft between London and Paris during the peace talks on a daily or weekly basis and they too would have known of the background and nature of the talks taking place.

In fact, during the course of the world war between 1916 and 1918, Canada had taken part in the "British Committee on Civil(ian) Aerial Transport" an "Imperial Committee" which looked at everything to do with civilian aviation as a result of all that had been learned during the war so far. That committee had sub-committees that dealt with everything from "Aeronautical Education" and "Airworthiness Certification" to international rules of flying, control of customs, rules of the road etc.

So great was the concern over "Control of Civil Aviation" post WW1 that the Governor General of Canada introduced the "Report of the Civil Aerial Transport Committee" into the Canadian legislative record thru Orders-in-Council. The G.G in Canada was and remains to this day the representative of the Monarchy and it is from their office that the Canadian Aeronautics Act still takes its precedence.

A link to the Report of the Civil Aerial Transport Committee - and a document can be found here: <https://archive.org/details/ReportsOfTheUKCivilAerialTransportCommitteeWithAppendices1918>

So great was the need for "Control of Civilian Aviation" that specific and unique controls for the operation and construction of aircraft as well as their continued airworthiness were required to prevent what was foreseen by many: a return to the days prior to 1911 when play-boy enthusiasts did whatever they wanted resulting in injury, accident, death and destruction of private property and public outcry. When the vast numbers of surplus war material - aircraft which could carry as many as 25-40 persons and dirigibles which could carry hundreds - was taken into consideration with the knowledge that in addition to "private aircraft ownership for pleasure" there were numerous "Private Companies" looking to acquire those machines and put them into service as "Commercial passenger and goods carrying machines" with the potential for great loss of life and public outcry the King in Council and the British parliament took steps to make sure there were no "Titanic's of the Sky".

Additionally, post WW1, ALL of the Imperial Gift aircraft in Canada were British Registered (G for George) and as such every one of those aircraft required a daily release by a British licensed "Ground Engineer". Those "Gift" aircraft also required releases after overhaul / repair by a British licensed "Ground Engineer". In order to do so, Canada had to adhere to the British legislation for the control of aircraft airworthiness.

The Governor General and Council wisely saw the exact same need here in Canada for "Control of Civil Aviation" as the British did in the UK and so "Control of Civilian Aviation" was brought into Canada using the British Law as a template - at least as far as "airworthiness Inspection" was concerned.

A vast source of background material related to Aviation Regulation in the UK and Canada can be found here : <https://archive.org/details/@air-researcher>

This material can assist all who seek to better understand the origin of Airworthiness regulation within a Parliamentary system.

The British "Aeronautical Ground Engineer"

The British "Ground Engineer" licenses issued to "Airworthiness Inspectors" conveyed substantial authority to the license holder and gave them the following delegated powers :

1. Supervise trades-persons,
2. Inspect for defects which rendered the aircraft or engine etc, unserviceable
3. Remove unserviceable aircraft or engine etc from service,
4. Prevent an aircraft from flying where defects would result in an accident,
5. Inspect quality and authenticity of materials used,
6. Inspect for quality of workmanship,
7. Notarise records of work performed on behalf of the Government
8. Attest to the moral character and suitability of potential candidates wishing to take up the role and license of a "Ground Engineer"
9. Report to the Government's Aeronautical inspection Department on their findings

The specific nature of the British "Ground Engineer" licenses issued to the delegated "Airworthiness Inspection Representatives" of the Air Ministry to accomplish certain types of "Inspection" were listed within the Air Navigation Directions in an alphabetical order:

- A. Aircraft (Airframe) - Daily inspection before flight
- B. Aircraft (Airframe) - Inspection subsequent to overhaul and repair before flight
- C. Engines - Daily inspection before flight
- D. Engines - Inspection subsequent to overhaul and repair before flight
- X. Electrical wiring and harnesses - Daily inspection before flight

American knowledge of British Airworthiness Inspection Representative Licenses

Near the closing of WWI the "American Aviation Mission" obtained valuable data on what the British were doing in relation to "Civil Aviation" once the war ended.

Documents contained within the U.S Library of Congress reflect that the United States Government was fully aware of the requirements for British Certificates of Airworthiness for Civil Aircraft in 1920, particularly that a Certificate of Airworthiness, when granted by the British Air Ministry, was not valid unless the aircraft or aeronautical product concerned was properly inspected and maintained by an authorized competent person known as a ground engineer - who was licensed as such, after examination by the British Air Ministry's Aeronautical Inspection Department (A.I.D) and that there was an Air Ministry requirement that periodic inspection of aircraft and aeronautical products under the care of a ground engineer was being carried out at annual intervals by representatives of the Air Ministry's A.I.D.

From the publishing of the British Air Regulations in 1919 and the A.N.D in 1920 until the passing of the Air Commerce Act and creation of the Bureau of Aeronautics within the U.S Dept. of Commerce, many of the individual "States" of the United States of America adhered to the British Ground Engineer's licensing requirements.

Similar to Canada, the American Civil aviation system was under Military Control

From 1919 to 1926 until the U.S Dept. of Commerce Bureau of Aeronautics was created American "Civilian Aviation" was largely under the control and influence of their military and the military officers are specifically noted as stating that ***for the American "aviation trades-persons" repairing aircraft the US would use the following British references:***

- A) Aircraft (Airframe) - Daily inspection before flight
- C) Engines - Daily inspection before flight

American interpretation and adoption of "The British System"

The American population largely unaware of and caring little about "British Politics" did not know of - or comprehend - the British Civil legislation - or the fact that British Civilian Law required "trades-persons" performing aircraft maintenance to be separately certified as competent by the "British Board of Trade" and that the "Ground Engineers" were not "just trade-persons" but were in fact additionally educated and qualified as Private Citizens licensed to act as "Inspection / certification" representatives of the British Government. Ground Engineers were frequently referred to in Aviation trade publications in the USA as "Air Ministry Police", not entirely unfounded due to the UK's Metropolitan Police "Traffic Manual" of 1920 containing the British Aeronautics Law and Ground Engineer references. Specifically Chapter 10 of the Metropolitan Traffic Manual beginning on page 428.

A link to Chapter 10 of the Metropolitan Traffic Manual can be found here:

<https://archive.org/details/metropolitantraf00romeuoft/page/428/mode/2up?q=Aerial+Navigation>

An example of the that gross misunderstanding by the American public is typified by an American aviation trade publication from 1920 which notes "Why the British chose to call their Engine Mechanic certificates "C" Licenses is confusing, so the American system shall use the letter "E" for Engines".

As previously noted, the US Department of Commerce used "E" on the "A&E mechanic licenses" they issued in order to reflect "Engines". The US Department of Commerce Aircraft Inspectors fell under a different training and licensing structure than the "mechanics".

From 1926 until the U.S Congress passed the U.S Federal Aviation Act, 1958 the American Aircraft maintenance technicians were issued a US-CAA A-Airframe and / or E - Engine certificate of competency. In 1958 the new US-FAA changed the "E" to a "P" to better reflect "Powerplants" because many commercial aircraft had auxiliary "engines" located elsewhere that did not drive a propeller and the FAA deemed the term "powerplant" a much better definition for an engine regardless of its' location in the aircraft.

The "inspector/certifiers" of US Civil aircraft prior to 1926 largely didn't exist except that the former military pilots accomplished daily inspections or had their "mechanics" do it for them.

Even in 1926, the Americans did not implement a requirement identical to the British for "Licensed inspectors" to be present and accountable to sign-off the trades' persons work as conforming to type design and regulation requirements.

In the US it wasn't until almost WW II that a well defined inspector system was implemented similar to what the British had implemented in 1919, and when the US did mandate it, it was for commercial aircraft, leaving "Private Aircraft" under the care and control of the pilot / owner - who largely had no formal training on airworthiness at the level required to accomplish what an British or Canadian AME was trained and licensed to do.

The U.S Dept of Commerce - Bureau of Aeronautics did issue "US-CAA" licenses to "Aircraft Inspectors". One notable Inspector being Amelia Earhart.

When the FAA took over from the Dept. of Commerce the FAA introduced a defined structure which clearly identifies both the "Technician certified as a competent trades-person" (A&P) as well as the "Delegated Airworthiness (Inspection) Representative (DAR-T / DAR-F) within separate sections of the U.S Title 14 FAR's and ORDERS.

In the U.S.A the "Mechanics" certificated by the FAA as competent to repair :

1. an aircraft is termed an "Airframe" (A) Mechanic.
2. an engine is termed an "Powerplant" (P) Mechanic.
3. Both an aircraft and aircraft engines is termed an "Airframe" and Powerplant (A&P) Mechanic.

An issue that occurred within the USA that is little known but which was to have dire consequences was that during WW the US government had been told that training of personnel to support the aviation program was of utmost importance and yet from the end of WW I until the beginning of WW II the US military largely dropped the ball on Engineer and Trades training and focused almost entirely on "Pilot Training". Canada apparently followed the US. A now declassified "Restricted" US Army Air Force report from 1944 related to the U.S Aviation Cadet

Ground Duty Training Program is well worth reading as it highlights what happens when training of ground personnel is not properly accomplished. A copy of that report can be found here: https://archive.org/details/DTIC_ADA529928

The US-FAA DAR, equivalent to the British and/or Canadian AME

In the U.S.A the "Delegated Airworthiness (Inspection) Representatives" DAR's are Licensed by the FAA as private citizen representatives of the US Government to inspect aircraft and engines etc for Airworthiness.

On August 28, 1940 the United States Aviation & Aeronautics "Rules, Regulations, Orders" were amended by Presidential Order. Donald H. Connolly, Administrator of US Civil Aeronautics amended the specific regulations as follows.:

TITLE 14—CIVIL AVIATION

CHAPTER I—CIVIL AERONAUTICS AUTHORITY

[Order No. 1]

Designation of Aircraft Inspection Representatives (A.I.R's)

"Acting pursuant to the authority vested in me by section 308 of the Civil Aeronautics Act of 1938, as amended, and finding that **this action is required to best effectuate the policies declared in, and the purposes of, said Act, and is desirable in the public interest,** It is ordered that:

(1) The Chief of the Certificate and Inspection Division is hereby authorized to designate such persons or agencies **as he may deem qualified and necessary to examine, inspect and approve certificated aircraft.**

Such persons or agencies shall be known as "Aircraft Inspection Representatives" and the approval of any such aircraft as airworthy, or the examinations or reports of any such representative, may be accepted in lieu of those made by officers or employees of the Administrator.

(2) **Any such designation shall terminate at any time the Chief of the Certificate and Inspection Division shall determine that such person or agency is no longer properly qualified as such Aircraft Inspection Representative.**

(Published on page 3404 of the U.S Federal Register (F. R.) Document # 40-3625; Filed, August 29, 1940 at 10:10 am

Currently in the United States of America there exist 3 types of "Inspection Representatives"

1. Designated Manufacturing Inspection Representatives" (DMIR's) who may perform examination, inspection, and testing services necessary to the issuance of certificates.

DMIR's are appointed in accordance with Title 14 CFR Part 183 :
Representatives Of The Administrator SUBPART C §183.31 who must possess aeronautical knowledge, experience, and meet the qualification requirements of Order 8000.95

and, two types of **DARs**:

2. Manufacturing (DAR-F), and
3. Maintenance (DAR-T)

"Designated Airworthiness Representatives" (DAR-F) may perform examination, inspection, and testing services necessary to the issuance of certificates (Manufacturing) .

DAR-F's are appointed in accordance with Title 14 CFR Part 183 : Representatives Of The Administrator SUBPART C § 183.31 and must possess aeronautical knowledge, experience, and meet the qualification requirements of Order 8000.95

Manufacturing DARs (DAR-F) perform mostly the same functions as DMIR's but work as individual consultants. They must possess aeronautical knowledge, experience, and meet the qualification requirements of Order 8000.95.

"Designated Airworthiness Representatives" (DAR-T) may perform examination, inspection, and testing services necessary to the issuance of certificates (Maintenance) .

DAR-t's are appointed in accordance with Title 14 CFR Part 183 : Representatives Of The Administrator SUBPART C § 183.33 and must possess aeronautical knowledge, experience, and meet the qualification requirements of Order 8000.95

US-FAA Maintenance DARs (**DAR-T**) must:

1. **Hold a mechanic's certificate with an airframe and power plant rating under 14 CFR part 65**, or
2. Hold a repairman certificate and be employed at:
 1. a repair station certificated under 14 CFR part 145, or
 2. an air carrier operating certificate holder with an FAA-approved continuous airworthiness program
3. **meet the qualification requirements of Order 8100.8, Chapter 14.**

Additional Pre-requisite and re-current qualification for holding an FAA issued "Inspection Authorisation" (I.A) all U.S DAR-T's are:

1. required to hold both a valid "Airframe" and Powerplant (A&P) Mechanic certificate.
2. Have had a clear record as an "A&P" with no infractions for a period of 3 years
3. Attend or otherwise acquire special education and training to become a DAR
4. Pass special examinations related to their function and activities as DAR's
5. Attend bi-annual refresher training courses acceptable to or provided by the FAA or forfeit their DAR certificate
6. Have a fixed base of operations.

Unlike Canadian AMEs, the US-FAA DAR-T's are allowed, by regulation / order, to charge a fee for their professional services under U.S Law.

DMIR, and DAR training provided by the US-FAA is specific, for the DARs there are 2 streams:

1. **Manufacturing** (DAR-F) training, and
2. **Maintenance** (DAR-T)training

NOTE: The Basic training program for Canadian AMEs combines the elements of:

1. Aircraft and Aeronautical product Engineering Design criteria, etc,
2. Aircraft and aeronautical product manufacturing processes, etc
3. Aircraft and aeronautical product maintenance processes, etc

in order to allow the AME to know the Canadian Legislation for, as well as Industry processes performed, in order for Aircraft and Aeronautical products to meet both initial and in-service airworthiness standards and requirements before the AME can attest and certify on the Minister's behalf.

US-FAA DAR-F training conducted by the FAA section AFS-640 consists of:

- A. Special Airworthiness Cert of Unmanned Aircraft Systems & Optionally Piloted Aircraft : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=591>
- B. Amateur-Built and Light-Sport Aircraft : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=301>
- C. FAA Initial Conformity Determination : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=398>
- D. FAA Recurrent Conformity Determination : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=410>
- E. Initial Aircraft Certification : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=123>
- F. Issuance of 8130-3 for Domestic and Export Approvals of Engines, Propellers, & Articles Only (Manufacturing) : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=395>
- G. Recurrent Aircraft Certification : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=284>

US-FAA DAR-T training conducted by the FAA section AFS-640 consists of:

- A. Ageing Airplane Inspection and Records Review : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=211>
- B. Amateur-Built and Light-Sport Aircraft : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=301>
- C. Field Approval Delegation : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=221>
- D. Initial Aircraft Certification : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=123>
- E. Recurrent Aircraft Certification : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=284>
- F. Recurrent Issuance of FAA form 8130-3 for Domestic or Export Airworthiness Approvals (Maintenance) : <https://av-info.faa.gov/DsgReg/Sections.aspx?CourseInfoID=376>

DMIR and DAR delegates require knowledge of US Orders, Regulations and Policy relating to Airworthiness and being an "Administrator's representative" including :

- 1. FAA Order 8000.95, Designee Management Policy
- 2. FAA Order 8000.372 (PDF), Unmanned Aircraft Systems (UAS) Designated Airworthiness Representatives (DAR) for UAS Certification at UAS Test
- 3. FAA Order 8110.4, Type Certification
- 4. FAA Order 8130.2 Airworthiness Certification of Aircraft
- 5. FAA Order 8130.21 Procedures for Completion and Use of the Authorized Release Certificate,
- 6. FAA Form 8130-3, Airworthiness Approval Tag
- 7. FAA Order 8100.8 "Designee Management Handbook"
- 8. FAA Order 8100.17 "Field Approval Delegation Handbook"

For additional information regarding FAA DAR "Designee Standardisation" contact the US-FAA:
Section AFS-640: Designee Standardisation
telephone: 405-954-6495

email: DesigneeSeminars@faa.gov

British Airworthiness Inspection Representative (A.I.R) licensing in Canada

In 1919 / 1920 Canada adopted the British system for Airworthiness Inspection Representative (A.I.R) licensing because it was a legal requirement in order to release "British Registered Aircraft" being operated in Canada, many of which were owned and operated by the Canadian Government as well as by Private Citizens, by a Licensed Airworthiness Inspection Representative of the British Government - a "Ground Engineer". Canada's Air Board issued these licenses thru the DND, but called them "Air Engineer Licenses".

The DND / Canada's Air Board issued Airworthiness Inspection Representative "Air Engineer" Licenses using the exact same method and format as the British Air Ministry did when issuing "Ground Engineer's Licenses" in England.

It is this direct link between British, Canadian and other the Commonwealth nations' legislation and personnel licensing requirements for governments' Airworthiness Inspection Representatives that allowed for the direct acceptance of "AME" licenses between England and the Commonwealth nations.

Fact:

In 1920 there were no "US" Federal laws or legislation regarding aircraft airworthiness in existence at that time, however the US Government knew of and acknowledged the "British Requirements for Airworthiness".

Canada's delegated "Airworthiness Inspection Representatives" - Air Engineers - were issued licenses to accomplish certain types of "Inspection" and these were also listed **in alphabetical order identical to the British Ground Engineer's Licenses:**

- A. Aircraft (Airframe) - Daily inspection before flight
- B. Aircraft (Airframe) - Inspection subsequent to overhaul and repair before flight
- C. Engines - Daily inspection before flight
- D. Engines - Inspection subsequent to overhaul and repair before flight
- X. Electrical wiring and harnesses - Daily inspection before flight

Air Board Executives & DND influence and Control

With control of Canadian Civilian Aviation being placed - at the beginning - under the control of the Canadian Militia, the Annual Departmental report of the "Militia and Air Service" submitted by the Canadian Minister of Defense and Deputy Minister of Defense to the Governor General and to Parliament serve to identify that the Minister and Deputy Minister, Governor General and Parliament collectively recognised the need and the requirement for "Ground Engineers" in Canada as they were part of what was "required for control of Civil Aviation in Canada".

Separate from those reports to the Governor General and Parliament the Minister of Defense issued the DOMINION OF CANADA - DEPARTMENT OF NATIONAL DEFENCE - Reports on Civil Aviation and Civil Government - AIR OPERATIONS. These reports are hard to find now, one source is the United States Library of Congress, another source - for 1928 - is here:

<https://archive.org/details/CanadaDND1928ReportOnCivilAviationNotInclMaps/mode/2up>

Because the Canadian Government owned and operated such a qty of "Imperial Gift Aircraft" post WW1 there was a requirement to establish within the Canadian Public Service the requisite job descriptions and candidacy requirements for the persons needed to fill the staff positions not

only of the Canadian Air Board, but also the various assorted roles behind the scenes. All of this was published in the Canada Gazette and is Public Record.

These roles include the Superintendents of Air Certificates, Superintendents of Licensing, Air Pilots, Air Navigators, Air Riggers, Air Fitters, Air Mechanics, and Foremen of Air Mechanics but NOT the position and role of the "Air Engineer" - although the Foreman of Air Mechanics was required to "possess an Air Engineer's License".

The public service also established "Tests for competency" for each of the positions listed - also published in the Canada Gazette - and various other reports of the government of Canada except for the role and position of the "Air Engineer":

<https://archive.org/details/air-board-trades-civil-service-1920s-re-organisation>

Why did the Air Board and Canadian Civil Service NOT create and publish any data related to the role, candidacy requirement and testing of "Air Engineers" in order to staff the Air Board and the Canadian Government's "Civil Air Service" including the Militia (later CAF and still later RCAF) squadrons?

From what can be determined from the documents currently available to the public, it is apparent that the Canadian Air Board either created the term "Air Engineer" internally or continued to use the RAF terminology from WW1 and failed to clearly define it as required within a Civil service and civilian government environment..

Why did the Air Board do this?

Possibly because the bulk of the Air Board Staff as well as the persons hired to staff the Government "Civil and Militia air Services" were returning RAF retirees (retirees rightfully being offered jobs before all others in government service post WW1) and as the majority were already "officers of the Crown" they 1) may not have "seen the need" to define or otherwise document what they already knew or 2) may have purposely used the RAF term instead of the Civilian terminology stated in legislation.

Today, we cannot know the Air Boards' purpose for doing so without full access to the DND, Justice department and Governor General's archives and the personal records of the Air Board and the Canadian Civil Air Service leadership for a review to be accomplished.

Either way, although the Canadian Air Board was "granted power over aircraft, pilots, mechanics, air harbours, etc" *the Canadian Air Board were NOT the authority for / behind the Ground Engineers's Airworthiness Inspection Representative license.*

The Ground Engineers - being a British legislative requirement - were licensed and controlled by the Air Ministry in London, UK. The Canadian Air Board / DND simply collected the completed paperwork, interviewed and administered the "tests" to acceptable candidates for Ground Engineer Licenses in Canada and issued them licenses as "Air (Board) Engineers in Canada - but the Air Board and DND did not hold the legislative authority for the Ground Engineer's Licenses but were required to employ Ground Engineers to comply with the British Legislation for control of Airworthiness.

Historical point of fact:

On **03 June 1921**, the editor of the US aviation magazine "**Aviation Weekly**" went on record at the end of an article written about the Canadian Air Board's "Air Engineer Notices" as saying

"The Canadian Air Board refers to the Aeronautical Ground Engineers as "Air engineers". It is pointed out that this might lead to some confusion in the future [...] an agreement on such and similar terms as far as they affect English speaking peoples would therefore appear highly desirable".

In 1920 (and for the next 100 years +) business owners and personal interest groups which did not want any sort of government involvement in the operation of the machinery which could render the machinery "non-flyable" and it appears that they worked to remove the Air Engineer as a "Civil Aviation Safety Inspector" from their businesses by undermining the authority and position of the Air Engineer whenever they were able.

From a review of articles, papers and statements recorded over the past 100 years, those persons also worked to ensure that they could have a means of "overruling" the Licensed AMEs - a documented fact that occurred in 1920/21 within a lecture published by the Royal Aeronautical Society that wound up being written into Canadian and other Nations Air Regulations.

That "addition to the regulations" required "the Pilot in Command of a Public Transport Category aircraft hold an Air Engineer / Ground Engineer License" - specifically so that the person in the cockpit or the owner of a business or an aircraft designer working for a company building / maintaining aircraft or anyone else who disagreed with the Air Engineer / Ground Engineer could overrule the Air Engineer / Ground Engineer.

Those who wanted to be able to overrule the Air Engineer / Ground Engineer / AME wanted the "Authority" that the license bestowed and the financial gain that that authority brought, but as has been demonstrated time and again, they do not want the accountability or liability that comes with the signing of the documents that the Air Engineer / Ground Engineer and now AME signs respecting aircraft airworthiness, serviceability, condition and conformity.

The General Public misled

For nearly the past 100 years the General Public has been misled into what the "Licensed AME" is - and it is NOT a mechanic. In Fact from 1920 until WW2 the Canadian Air Board and its later evolution the Department of Transport issued separate "Air Mechanic" certificates to the "Trades-persons" who performed aircraft Maintenance.

Minister Alghabra, that editor could not have been more correct in his foresight that there would be "some confusion in the future". In fact, that confusion as to "what a Ground Engineer / Air Engineer is" has grown, been intentionally spread far and wide and now poses a serious threat to aviation safety not only in Canada but world-wide.

Persons and groups of persons have, since the origin of the License, worked to undermine the rule of law, undermine the Orders-In-Council which brought the "Ground Engineers" into Canadian legislation and aeronautics regulation and later suborned the Canadian Parliament to usurp Parliament's authority.

Through my research work into the origin of the Canadian AME, I have been able to tie the Canadian AME (formerly AIR Engineer) back to it's British Birth Certificate and the British "Aeronautical (Ground) Engineer" commonly referred to simply as "Ground Engineers".

Ground Engineers were, and - thru the changes in terminology - remain the Nations' ORIGINAL, albeit Licensed Private Citizen "Civil Aviation Safety Inspectors" with the responsibility for accomplishing the delegated role of Safety Oversight within private businesses that manufacture and repair Canadian Aviation products and Canadian Registered aircraft in order to ensure initial and continued airworthiness and the certification of aircraft / aeronautical products for safe return to flight.

These private citizens are delegated this role because the Governor General, the Minister of Transport (or the Minister's directly employed staff) are unable to be everywhere in Canada at the same moment in time to accomplish this function - necessary to support Canada's commitment to ICAO and the participating nations to the ICAO.

The ICAO perspective on the need for AMEs

In 2017 Mr. Stephen P. Creamer - Director of the Air Navigation Bureau, ICAO delivered a presentation to the ICAO Council on the "Availability and Competence of Technical and Inspection Personnel in Civil Aviation Administrations". That presentation can be found here:

<https://archive.org/details/availability-and-competence-of-technical-and-inspection-personnel-in-civil-aviation-administrations>

A key and focal point of Mr. Creamers presentation is the requirement for individual Nations to support their international Commitments to Civil Aviation Safety by ensuring their National Civil Aviation Authorities have sufficient "delegated Airworthiness Inspection Representatives" who are crucial in accomplishing specific State requirements agreed to under ICAO

Slide 5 of Mr. Creamers' presentation draws attention to **ICAO Annex 19** which says:

"The State shall:

1. **establish minimum qualification requirements for the technical personnel performing safety oversight functions, and**
2. **provide for appropriate initial and recurrent training to maintain and enhance their (the technical personnel performing safety oversight functions) competence at the desired level."**

In response to the ICAO finding that States are not able to properly support their required airworthiness oversight activities or to ensure that enough qualified and competent aviation professionals are available to the state's CAA to operate, manage and maintain their national air transport system - specifically "Technical and Inspection personnel". Slide 9 of Mr. Creamers' presentation draws attention to 2 solutions, both of which are required to support Airworthiness oversight activities :

1. INSIDE Staff of a Nations CAA, and
2. OUTSIDE Staff of a Nations CAA; i.e Delegates performing Airworthiness Inspections and certification of new and in-service products.

The INSIDE "Technical and Inspection" Staff of a Nation's CAA requires:

- a) A Civil Aviation Safety Inspector (CASI) Baseline, and
- b) A Government Safety Inspector (GSI) Training Programme

The OUTSIDE "Technical and Inspection" Staff (not necessarily paid) of a Nation's CAA requires:

- a) A Civil Aviation Safety Inspector (CASI) Baseline
- b) Government Safety Inspector (GSI) Training Programme
- c) Delegation of Tasks and Functions
- d) National Aviation Safety Oversight System
- e) National Civil Aviation Safety Inspector (CASI) Database

From the presentation it is realised that to support a candidate Airworthiness Inspector AME's application the following should be required by Transport Canada:

1. Personal information
2. State Organisation - training , standards etc.
3. Education and training in one or more pre-requisite disciplines:
 - a) Aeronautical Engineering theory (including aeronautical Design and Inspection theory and practice)
 - b) Specialist Inspection / certification education and training
 - c) Aircraft Maintenance theory and practice
 - d) Aircraft manufacturing theory and practice
4. Specialist Maintenance and / or manufacturing experience
5. Specialist Inspection / Certification Experience
6. Substantiated Work Experience / Resume

7. Training and educational support documents & certificates for each area concerned.
 8. Memberships in professional associations
 9. 2 years **inspector experience** as a candidate, or with a current **inspection authority** authorization or similar document with at least 2 years experience
 10. English Proficiency for the role of the Technical and Inspection" Staff member
 11. Aviation Maintenance / Manufacturing Trade's work-perform competency check
 12. Airworthiness Inspector / certifiers' work-perform competency check
- All of which requires defined standards to be met and subsequent validation of the candidate by Transport Canada.

The change from Air Engineer to Aircraft Maintenance Engineer

Below is a link to a document with some information you might find helpful to raise awareness of the legislative origin of the Ground Engineer / Air Engineer / Aircraft Maintenance Engineer within Canada.

<https://archive.org/details/a-guide-to-the-aircraft-maintenance-engineers-license-examinations-1949>

The document reveals the exact period of time when the term "Aircraft Maintenance Engineer" entered the Parliamentary purview in the UK as well as why the specific word "Maintenance" was used.

Since Canada directly followed the UK the term "Aircraft Maintenance Engineer" entered the Canadian legal dictionary at the same time (1946) and replaced the term "Air Engineer".

This fact is highlighted by advertisements in the Canada Gazette circa 1946 -1948 relating to the Canadian Government seeking to employ "persons holding an Air Engineer's A and C License or persons holding the new AME M License with A and C ratings".

Fortunately the Canadian Dept. of Transportation did what the UK Air Ministry did in 1938 when Canada issued the 1939 compilation of "Notices to Owners and Ground Engineers" and incorporated the terms of reference for the Air Engineer that were then in existence into the appendix of the Notice.

The UK issued notices date back to 1920 (origin of the notices) but the Canadian document does not for the specific reason that the Canadian Air Board issued the exact same notices as those issued in the UK until 1927 when it began to issue "Canada Specific" notices to Air Engineers.

The authority for the "notices" issued by the Canadian Air Board between 1920 and 1927 came directly to the Canadian Air Board from the British Air Ministry until Canada adopted its own aircraft "registration" structure and moved away from the "G-" registrations for "British Aircraft" in 1927.

Also, here is a link to the Canadian Department of Transportation "Notices to Air Engineers and Owners published in 1939" - a document that your office may not possess or have been aware of:

<https://archive.org/details/AirEngineerNotices19271939>.

Throughout the document are references to what an Air Engineer can and must do as well as what they may not and should not do, but more importantly the last 6-8 pages contain the terms of reference for Air Engineer Licensing and individual license ratings and requirements immediately prior to WW2.

These "Notices" are what most of us older AMEs today would remember being issued by Transport Canada as "Notices to Aircraft Maintenance Engineers and Aircraft Owners - NAMEAO's".

Sadly these "Notices" are no longer issued - in fact Transport Canada rarely issues notices to AMEs and never provides any supplemental or recurrent training to ensure that the Minister's External Delegates" remain up to date.

A booklet published by the A.R.B in the UK " Duties Of A Licensed Aircraft Engineer" to support the British Licensee in 1939/1940 is found here:

<https://archive.org/details/DutiesOfALicensedAircraftEngineerCirca1940>

Additional information was published in 1943 regarding The Regulations Governing The Airworthiness Of Civil Aircraft was published by the UK A.R.B.

<https://archive.org/details/ARBReferenceHandbookNo1NotesOnTheRegulationsGoverningTheAirworthinessOfCivillian>

Principle employer of AMEs in Canada

CARs mandates that the AMEs receive periodic and update training which is to be provided by their employer. The AMEs have 2 employers:

1. the Minister on whose behalf they act as delegate Airworthiness Inspectors, and
2. the private sector business that employs them due to not only an ability to perform maintenance but because they hold a license to subsequently inspect and release that maintenance work.

Of ALL of the AMEs in Canada, some 15 thousand persons - the AMEs have not received ANY specific and focused continuation or update training respecting our roles and duties as Ministers Delegates from Transport Canada in many years, and certainly no bi-annual refresher training from Transport Canada or anyone else regarding the "Roles and responsibilities, industry changes etc" as mandated by your American counterpart for the U.S DAR-F and DAR-T (I.A's)

It therefore is of supreme importance that the AMEs legislative purpose as an Aviation Safety Inspector to

- 1) oversee maintenance and manufacturing activities leading to certification
- 2) inspect the work materials and the workmanship to ascertain and maintain acceptable levels of quality and safety against the design and operational standards, and
- 3) act as a Notary to the Government of Canada in respect of the Aeronautics Act and attest / certify / bear witness to the completeness of work, adherence to requirements and accuracy of the facts stated by the person(s) making entries in the records"

Be properly defined and documented not only within CARs but also within the Aeronautics Act which the CARs support.

Additionally, it must be firmly established that the Air Engineer (now AME) was not and is not an "Air Mechanic" as many would like to believe (and lead others to believe) but that the Air Mechanic was a separate and unique certificate of Competency issued to persons which the Canadian Air Board certified separately by way of the DND as a "trade's-person".

The CARs today require clear and definitive information to be introduced to differentiate between the very different and distinct roles, responsibilities, accountabilities training and

competency standards, policies and procedures of the Air Mechanic / AMT vs those of the Aircraft Maintenance Engineer.

Maintenance certificate of competency a pre-requisite to AME qualification

Since nearly the very beginning of regulated civil aviation in Canada post WW1, the Canadian Department of Defense not only issued 2 separate certificates, one to Air Mechanics, the other to Air Engineers but the Published reports of the Canadian Department of Defense "Militia and Air Service" delivered to the Governor General and Parliament by the Minister of Defense and the Deputy Minister of Defense listed the qty of each of the 2 types of certificates issued and also who the Air Engineer Licenses were issued to. The reports of the Canadian Government also identified who had had their Air Engineer License revoked, suspended or surrendered. Additionally, these reports were published and sent "with Compliments" to the Governments of the U.S.A and U.K.

Sadly, since nearly the very beginning of regulated civil aviation in Canada post WW1 the general population has been told Air Engineers /AMEs are trade's-people only and rarely have the Government's Policy makers let alone the general public been correctly informed of the truth of what the "Licensed Air Engineer/ AME" is - leading to a serious and extremely dangerous misconstrual of the legal role of the AME by nearly every person in Canada today..

That misconstrual has resulted in the "trades-person performing maintenance" (Air Mechanics / Aviation Maintenance Technicians) being inappropriately merged with the "person responsible for oversight and certification of the trades-person, inspection and certification for condition and conformity and subsequent notarisation of the trades work documents" (AMEs) - two unique and vastly separate roles and responsibilities.

That misconstrual and merging has led to the continual devolution of the education and training of Licensed Airworthiness Inspectors as originally intended, to a point where graduates from Transport Canada approved AME education programs are being trained to be mechanics by mechanics and many see themselves, once issued an AME license, as "licensed Mechanics".

Many today are unaware of the direct correlation between British and Canadian publications such as the British document titled "A.P 1208 Airworthiness Requirements for Civil Aircraft , Vol 1- Design & Vol. 2 Inspection" (D&I handbook) and the Canadian Document titled "The Engineering and Inspection Manual" . Most do not know that the Canadian E&I manual evolved from British D&I Handbook and that this tie between nations only serves to further strengthen the proof-point that the Canadian Air Board directly adopted / used the "British" legislation, structure and guidance materials as the foundation of what we know as "Airworthiness Control" and "AME licensing" in Canada today.

AMEs to be trained in Aeronautical Design requirements

In England, British "Ground Engineers" and later AMEs were required to be trained to know BOTH volumes of A.P 1208 so that they not only knew the "Inspection Criteria" but also how the aircraft and aeronautical products were being designed to meet the criteria prior to being inspected so that initial and continued airworthiness inspection activities could be ensured.

Important Information to Note:

A.V.M Stedman (Canadian Air Board) makes mention of the British handbook of aircraft design requirements in his memoirs reflecting Canadian Civil aircraft design standards etc came from British books on the subject .

He refers to the British Air Ministry document "A.P 1208 Airworthiness Handbook For Civil Aircraft". A.P 1208 consisted of 2 volumes:

A.P1208 Vol I - Design (engineering) Section, and

A.P1208 Vol II - Inspection (engineering) Section.

A.P 1208 was the British handbook containing required education and training material for the AMEs of the time. The AMEs of the day were also required to possess a copy of

each volume for reference - just as we AMEs were required to be trained in the Canadian DOT "E&I Manual" and to possess copies of it for reference.

The British A.P 1208 Vols I & Vol II were used by the Canadian Air Board and evolved into what many years later became the Canadian DOT's "Engineering & Inspection Manual". A copy of AP.1208 Vol I and Vol II can be found here:

<https://archive.org/details/Pub1208Vol1Design>

<https://archive.org/details/UKAirMinistryAirworthinessHandbookForCivilAircraftPublicationNo.1208Vol2InspectionSection1938>

For the Royal Canadian Air Force "DND/Service side of the coin in 1924 the British Handbook is A.P 970 - Design Requirements For Aeroplanes For The Royal Air Force" would have been the book used to set the design requirements. A copy of A.P 970 can be found here :

<https://archive.org/details/AirMinistryPublicationNo.970DesignRequirementsForAeroplanesForTheRoyalAirForceAP970>

The Canadian Air Board and DND - RCAF would have also used the many Air Ministry documents related to Air Regulations, Aircraft types, Aircraft construction etc.

Attached are links to four (4) Aeronautical Ground Engineer's and Aircraft maintenance Engineer's licenses issued by Great Britain and 2 British Commonwealth nations.

Great Britain & Northern Ireland - Aircraft Maintenance Engineer's License:

<https://archive.org/details/british-aircraft-maintenance-engineer-ame-license-1946-c.-a-form-9>

Great Britain & Northern Ireland - Ground Engineer's License:

<https://archive.org/details/british-ground-engineers-license-1936-c.-a-form-9>

South Africa - Ground Engineer's License:

<https://archive.org/details/union-of-south-africa-ground-engineers-license-1937-c.-a-form-12-a>

Southern Rhodesia - Ground Engineer's License:

<https://archive.org/details/southern-rhodesia-ground-engineers-license-1938-c.-a-form-12-a>

These licenses were issued to the same individual between the 1930's and 1946 and as such help substantiate a lineage of licensing evolution from "Ground Engineer to Aircraft Maintenance Engineer".

A license common to all Nations of the Commonwealth

All of the former British Colonies, Dominions as well as the territories and protectorates either issued the same licenses or accepted the License issued in 1919 by the British Air Ministry, later MCA in England and now under the UK-CAA. As you can see, this is an issue which ranges farther than Canada's borders, and now has an impact upon the acceptance of AMEs licensed by other nations entering Canada as immigrants or being issued ACA privileges by Canadian aircraft owners and air operators. The issue also affects nations which issue reciprocal derogations or licenses to Canadian AMEs that will subsequently inspect and certify the aircraft of that nation.

A reference to the Commonwealth of Australian Government Air Regulations including their licensed "Ground Engineers" dating from 1938 but originating in 1920 can be found here:

<https://archive.org/details/australian-statutory-rule-no.-156-1938>

Canada was no different from its licensing of Airworthiness Inspection Representatives to any other British Commonwealth nation - except in terminology.

Although the Canadian Air Board termed the holders of the Ground Engineer's License "AIR Engineers", the legal requirement for the license as well as the duties / roles / responsibilities of the License holders in Canada was the exact same as those holding British "Ground Engineer's licenses" and was incorporated into Canadian legislation by Orders in Council and later, in 1927, by the Aeronautics Act, 1927, and now reflected under the current Canadian Aeronautics Act section 4.3.

When coupled with the Canadian Government's published recognition of "Ground Engineer's Licenses being required for Control of Civil Aviation in Canada" this direct link to the AME's birth certificate and evolution substantiates the need to reinforce the position and authority of today's AMEs.

The holder of a Ground Engineer's License, AIR Engineer's License / Aircraft Maintenance Engineer's License - irrespective of the British Nation / Commonwealth Nation / Territory / Protectorate that issued the license - is, while acting on behalf of the Minister performing Airworthiness Inspections, performing **a delegated duty of great legal and moral responsibility**.

The lives of the crew and passengers flying in Canadian aircraft and of the persons on the ground in Canada, as well as the private property over which the aircraft flies is dependent on the high level education and subsequent training candidate AMEs must receive to function as license holders in order to accomplish inspection, supervision and certification duties.

The security and safety of the inspection accomplished is directly related to the integrity of the License holder as it is the quality of their inspection and the integrity of their certification upon which Aviation safety truly rests.

The licences issued to Ground Engineers, AIR Engineers and later Aircraft Maintenance Engineers was not, is not, and should not be regarded as a "Certificate of Competence to perform aviation Trades'-work".

The AME License of today is an authority resulting from Royal Decree in 1919, the British Parliamentary Aeronautics Act of 27 February 1919 (as amended in 1920 and subsequent) to inspect and subsequently certify that any work done on an aircraft or aircraft engine, propeller or aeronautical product has been executed in accordance with the Regulations and the aircraft or aeronautical product conforms to the stated requirements and is "Air-Worthy" and in a safe condition for flight.

Dual Capacity of the AME that must be stated to AMEs and others

The Minister and government as well as all others who have an interest or take-away related to AME licensing must be made to recognise that the holder of a Ground Engineer, AIR Engineer and later Aircraft Maintenance Engineer License **may** in fact "act" in a dual capacity:

1. **initially, that of the work performing trades-person** (so long as certified competent to perform that work by Board of Trade / Provincial Authorities respecting B.N.A Powers) in order to prepare an aircraft or aeronautical product for inspection, and
2. **lastly, as the Minister's Delegated Airworthiness Inspection Representative (A.I.R)** acting under the combined weight of the Air Navigation: Order, ACT, Regulations and Directions pertaining to Aircraft Airworthiness as amended and currently in force.

This "dual-capacity" makes the position of the Ground Engineer, AIR Engineer and now the Aircraft Maintenance Engineer, an extremely difficult one and a divided loyalty.

As a result of that divided loyalty the AME, must be unmolested by the company/person who employs them as "Trade's-persons" when they are acting in accordance with the terms and conditions of their AME License as Ministers' delegates.

It must be clearly understood that when the maintenance trades-work is finished and the licensed Delegate inspects that trades-work that it is at "that later point" when they are acting under the authority granted to them as delegates of the Minister and that **the delegated license holder must not certify** if the aircraft / aeronautical product does not conform. (Withholding of Certificates per Section 7.1 / 7.1(1) (b) of the Aeronautics Act)

If a Private Company that employs "Aviation Trades-persons" wants better trained and qualified trades-persons then they need to ensure they hire people who hold a proper "Trade's-Persons" certificate of competency issued subsequent to completion of a proper trades-persons apprenticeship to perform "Maintenance" as a stand alone document.

The training and certification of trades-persons is a "Provincial" area of responsibility, but nothing prevents the Provinces from training and certifying to "Federal Standards, policy, rules" etc. and to require trades testing be independently accomplished after completion of the period of apprenticeship and that the trades person shall not be trades-tested by the educational providers (colleges etc) that provided the basic education to the trades-persons.

Not certifying the aircraft or product as a delegate of the Minister signifies that the Minister is withholding / rescinding the Airworthiness of the aircraft in accordance with the Aeronautics Act section 7.1 etc. until the reason is corrected and another inspection is accomplished.

Note of Important Information:

In the U.S.A the American "I.A" records and certifies such a statement in the aircraft's log-book, along with the specific conditions and requirements that must be met - including the performance of work by the holder of an A&P mechanic certificate" before the aircraft can 'Return to service with a re-activated C of A'.

Also in the U.S.A, the I.A is required to report separately those same conditions and findings of the inspection to the FAA unlike Canada where the A.A.I R is filled in and reported by the aircraft owner based upon the results of the last inspection".

The I.A in the U.S.A accomplishes their direct reporting direct to the FAA, they cannot rely on anyone else to accomplish the task or usurp or undermine their authority as an I.A. by reporting for them.

Canada has no longer has any such stipulations / requirements.

Authority Vested in the AME as a Minister's Delegate

It is the authority granted to the holder of an AME license and their mandate by the Minister to refuse to sign and withhold / suspend the Airworthiness certificate that so many people have taken umbrage at, yet this is the legal and moral requirement of the license holder.

Interference with the AME accomplishing that legal obligation is a contravention of the Aeronautics Act and CARs, and the reason why so many others seek to usurp the authority inherent in the license for themselves.

Although in the distant past pilots were required to hold AME licenses as a pre-requisite to their becoming a "Commercial Pilot" or an "aircraft commander" this is no longer the case. Civilian Pilots do not now go thru or are otherwise required to attend the same lengthy and highly focused course to become an AME and, except for a period between 1924 and the mid 1950s when the University of Toronto taught an "Aeronautical (Ground) Engineering Extension program" which delivered the required higher level theoretical education in Engineering and Aeronautics that was one route of obtaining the fundamental theoretical engineering education for Air Engineer License Candidates (and widely accepted by the RCAF as required education

for persons desiring positions as Pilots in Canada's Air Force) - today's University Engineering students receive very little if any of the full AME course expected to be delivered to AME students in Canadian College programs approved by the Minister.

Yet there are many in the pilot and design engineer community believe that they automatically have the "Authority to make determinations of Airworthiness", resulting in aircraft being "released by a pilot" or "released by a D.E employed by an Air Operator or AMO" without a proper inspection by an AME - in many cases for revenue and passenger carrying flights, and later found to be "Not airworthy" - this must be corrected because each time it occurs and there is no follow up action or an incident occurring their mistaken belief is only reinforced, and the public sees them as "Hero's who got them where they needed to go" or "Hero who got the aircraft out of the hangar on time".

This issue has created a failed safety culture in aviation that has 100 plus years of support for "doing it wrong and getting away with it". If such instance ended in fatality then perhaps that flawed aviation culture would be investigated and rectified - but there are more escapes and near misses that the public sees as heroic that continually reinforce aviation's flawed safety culture and the behaviour of those who believe they can override the AME or that the AME is not needed.

The belief that someone can countermand the AME only lasts until there is an accident - at which time the Licensed AME who released the aircraft immediately prior to the accident being blamed, in many instances the "Human Factors" part of the investigation fails to look backwards to see what flawed company or community culture caused the source of the problem - instead laying the blame on the person who did the work and signed the release.

In Canada, the AIR's were noted by the Hon. V. Moshansky to "require reinforcement" in Vol. 3 of the Dryden Air Accident investigation.

To date, this stated condition within the Dryden Air Accident report to support the AME has NOT been accomplished, in fact the very opposite has taken place.

The Minister's cadre of "Airworthiness Inspection Representatives - AMEs, have today been undermined and turned into "trades-persons" under the very instructions and publications of your office on the misguided advice of the unknowing or of those with intent and, as a result, Canadian Aviation Safety is being placed in Jeopardy.

What many do not know is that the "higher level engineering education required to be an Air Engineer was originally only available in England or thru distance education programs of British Engineering Universities and Colleges, but in Canada via the University of Toronto from 1924 onwards.

AME licensee prerequisite education, pre-requisite certificates of competency to perform maintenance as a trades-person, as well as their higher level Aeronautical Engineering training, and final certification, testing and license issue requires substantial review and the AMEs require FIRM support to be enabled once again to assume and hold the Airworthiness Inspection Representative (A.I.R) licenses being issued to them.

Additionally, Canada needs to establish a clear title, route of training and competency certificate for aviation "trades-persons" as "Aviation Maintenance Technicians" - or, as originally termed in the reports of the Minister and Deputy Minister of Defense : "AIR Mechanics". This clarity must include separate "Aircraft Mechanic Certificates of Competency issued by the Provincial Trades boards to persons who meet the Federal standards that must be written into CARs for performance of maintenance and they must be tested, mentored and qualified similar to RED Seal trades-persons.

The AMEs - as Delegated "Private / external" Airworthiness Inspection Representative (and a stipulated ICAO requirement) must remain in place and must be the 2nd step in aviation engineering maintenance qualification and certification.

The "Air Mechanic Certificate of Competency with a period of at least 2 years full time work as an aircraft trades-person since issue of that certificate must be a Pre-requisite for candidacy to hold an AME license, and the level of required technical engineering and inspection education must also be elevated as currently the holders need little more for entrance into the program out of high-school than a 50% pass in English and very little in the way of foundational maintenance / engineering education or practice - which severely burdens the Colleges.

Canadian AMEs are the Equivalent of the United States "DAR-T and/or DAR-F" : *Delegated* Airworthiness (Inspection) Representatives, otherwise known as "FAA A&P with I.A"

Canadian AMEs - as Minister's delegates responsible for Airworthiness Inspection require their Delegates' Handbook be brought back from where it has been discarded and re-established. The AMEs also require a concise written contract between the Minister of Transport and the license holder to lay out exactly what the license holder is accepting from Government when they become an AME and what is expected of them.

A correction must be made to CAR Part V and CAR standards related to CAR Part V respecting "AIR's" due to a misunderstanding or assumption that a University educated design Engineer can automatically assume the DAR role, a misinformed direction that the Minister's office has been and is currently taking.

Canadian DE's who currently see themselves as "Ministers DARs" are, in fact, the Equivalent of the United States "DER" : *Design Engineering* Representatives and this needs to be clarified within Transport Canada literature and the CARs in order to correctly align Canadian DE's with their American counterparts.

Failure to correct all of the issues regarding Canada's "Airworthiness Inspection Representatives", return the AMEs to their original role as AIRs and to correct the current error in their Transport Canada specified training that states they are to graduate from the current training TCCA program as

"Fully qualified trades-persons with the expectation that they will assume the Roles / Responsibilities of the AME License"

will only continue to erode Canada's Aviation Safety framework.

How can a person be "Expected" to perform Airworthiness Inspection - especially to such a high level, when all of their foundation has been either removed, negated or otherwise undermined?

For a number of decades now, Candidate AMEs have received very little - or very poor - training to hold the license and act as Ministers' delegates and many AMEs obtaining TC licenses upon arrival in Canada have never received that type of high-level training - especially those that are issued AME licenses to on the basis that they held an "A&P certificate" and not the additional "Inspection Authorisation".

Canadian AME education and licensing - an International Problem

By issuing AME licenses to "A&P mechanics" and "AMEs" from many other nations who have never been properly trained, received the proper on the job training and subsequently been examined and found competent to act as "inspection Authorised" representatives" of their own government because their government's AME training and licensing programs have the same issues as here in Canada, the Government of Canada has unwittingly opened the door to a flood of "incorrectly trained and qualified" people from around the world wishing to become Canadian AMEs and subsequently undermined the Canadian program for initial and continued airworthiness of all aircraft / aeronautical products the holders of those licenses issue releases for.

The overriding view

Since the overriding view that "AMEs are TRADES-persons" has been so completely placed into the minds of educators, regulators, business owners and the AMEs themselves, the focus of training the AME to be an "Inspection Officer" has been undermined and largely subverted.

Most people fail to understand that, in Canada, the Governor General (the representative of the British Monarch) is the person holding the Aeronautics Act's power - because the G.G represents the Crown in the area of the "highest level legal issues in Canada".

The G.G gives the Minister of Transport the ability to do things - not the other way around, as such the AME and the AME license must be reflected within CARs verbiage as receiving authority from the Act.

Without taking special training to be AMEs, completing the required airworthiness inspection and personnel supervision tasks and then passing required examinations by way of combined Oral, Practical and Theoretical testing, no other persons, including pilots are able to automatically, intuitively or otherwise hold an AME license.

Many people are completely unaware that Post WW1, Canada's Air Engineers' were included in submission for a federal ACT for "Engineers" to become "Professional Engineers" P.Eng's. That submission was made by the members of the Engineering Institute of Canada - a "Nation-wide" organisation. A copy of the original document containing that inclusion was found within the slipcover of an annual Journal of the Canadian Engineering Institute of Canada of the year the submission was made.

The need to re-establish a clear and identifiable link

There is no longer a clear and identifiable link between the Authority behind Canada's original Delegated Airworthiness Inspection Representatives - Licensed AME 's presently stemming from Sections 4.3, 7 (1) and 7.1 (1)(b) of the Aeronautics Act and the Transport Canada defined Candidate AME training program, policy and standards for prospective License holders to accomplish their legal duties in support of the Aeronautics Act and CARs. The current Transport Canada training references and stated objectives of the Transport Canada AME training program are directly opposed.

The Appendix C - Part 1 Curriculum for Part V - Airworthiness Manual Chapter 566 - Aircraft Maintenance Engineer (AME) Licensing and Training may be getting taught from the point of view of the "mechanic" accomplishing the maintenance and not to establish the point of view required of the Licensed AME required to accomplish oversight of the trades'-work and to accomplish condition and conformity inspections etc. and certify aircraft and aeronautical products subsequent to the maintenance trades'-work

With a shift in perspective from that of "Certifying Inspector" to that of "Mechanic" Canadian Aircraft Maintenance Engineer (AME) applicants graduating from the college programs are being trained to "perform Maintenance" activities but not "inspection and certification activities

Your AMEs are being issued a license to accomplish a role they are improperly trained, apprenticed and licensed to perform. The Minister can also no longer rely on the oversight and signature of an AME to support that the candidate put forth for Licensing as an AME is actually capable of Acting as an AME. Graduates from Canadian Colleges are now largely trained to be mechanics by mechanics and to see themselves once issued an AME license as "licensed Mechanics" instead of Licensed Airworthiness Inspectors as originally intended.

TC published information states:

"Part of the aircraft maintenance engineer (AME) application is providing **proof that you have performed maintenance tasks**"

But there is nothing that stipulates:

"The overriding part of the aircraft maintenance engineer (AME) application is **providing proof that you have education and training on aircraft design and certification requirements and that you have satisfactorily performed Inspection and certification tasks**"

TC published information states:

As proof of training, "the applicant shall provide a certificate of successful completion of an acceptable aircraft maintenance training course"

But there is no specification mandating:

"as proof of training as an airworthiness Inspector, the applicant shall provide a certificate of successful completion of an acceptable training course in aircraft and aeronautical product certification, continued airworthiness certification and airworthiness condition and conformity inspection".

TC published information states:

"Supporting documents to the application, such as the applicant's personal log book or other original record of training and experience, shall either be original documents, or be certified as true copies of the originals by the holder of a valid AME licence or a Transport Canada Civil Aviation Safety Inspector (CASI)."

But there is nothing that stipulates:

"Supporting documents to the application, such as the applicant's personal log book or other original record of training and experience **specific to that of an Inspector/Certifier of Airworthiness**, shall either be original documents, or be certified as true copies of the originals by the holder of a valid AME (AIR) or or a Transport Canada Civil Aviation Safety Inspector (CASI).

Impartial and independent 3rd party quality control

Unlike Provincially accredited Trade's persons who are impartially mentored and tested continually during and subsequent to their apprenticeships, the Minister is now relying upon:

- 1) the word of the Education Provider that the person "is qualified"- a direct conflict of interest, and
 - 2) the word of a prior product of that education program (which were never independently and impartially mentored and tested during and subsequent to their apprenticeships).
- to attest to the quality and accuracy of the training provided by TC's currently accredited Basic AME training programs .

In effect there is no impartial and independent 3rd party quality control of:

1. the AME basic academic training, on-the-job practical training and qualification program / system or
2. the educators that currently produce candidate AMEs.

The direct result of this quality control failure is that Canada's AMEs are being improperly accredited in a manner which to which the People of Canada may take offence.

A 2 - Tier License structure & Program for Canada

Without a clearly defined and structured 2 tier system to accredit and certify AMEs in Canada:

1. there is no unique "Air Mechanic / Technician" trades-person training and certification system in existence in each Canadian Province to produce credentialed and knowledgeable *trades-persons* who can after a period of holding a AM or AMT certificate without fault or incident, - apply to become candidates in an TC defined and accredited *AME role specific training and accreditation program*.
2. People *performing* "aircraft maintenance" are not possessed of an "Air Mechanic / Technician" certificate and are not required to pass thru a recognised and structured Provincial "Trades-Persons" apprenticeship with impartial 3rd party oversight and to complete any final oral, written and practical testing to establish their level of competency before being issued a "Trade's Certificate of Competency" once they exit the training providers premises.

3. there is no clearly defined structure or required listing of tasks and training associated with Transport Canada's AME certification system in order to produce the required educated and knowledgeable candidates prior to them undertaking additional on-the-job-training as "inspector / certifier / supervisor" under properly accredited and trained "Mentor AMEs" before taking their TC examinations obtaining an AME License to inspect and certify aircraft and aeronautical products as Airworthy on the Ministers behalf.

The current AME training and Licensing program

The Minister's current "accredited AME training program":

1. is training people to accomplish one function and role (maintenance as trades persons), after which
2. the Minister's staff are issuing the graduates of the TC program "AME licenses" which are intended to accomplish another completely function and role.

Without the candidate AME having been properly trained / qualified / tested / accredited to do either function or role correctly or completely.

Why? Because without a clearly defined 2 tier license structure specified by the Minister:

1. correctly laid out,
2. correctly taught and
3. to which people are correctly tested

what is ultimately being accomplished and delivered to the Minister is flawed.

Interference in AME role, education and public image by Non- AMEs

For over a century, non-AMEs have sought to take for themselves the power and authority of the AME license that is given to the AMEs by Royal Decree and the Aeronautics Act.

This is why:

- A. those without the license, and
- B. the knowing or unwitting supporters of those without the license

have worked tirelessly in the open and behind the scenes to place the idea into the Public mind that AMEs into nothing more than "Mechanics" while trying to place themselves as "The Authority" for airworthiness in the minds of politicians, university professors and the general public ..

Very few people today - including the licensed AMEs themselves - really know what the AME is and what the License is to be used for.

AMEs are NOT "Licensed Mechanics", the license is not supposed to be used to say "I certify I did the maintenance".

The intent is that the AME can act as a representative of the People of Canada and firmly, proudly attest that "subsequent to my condition and conformity Inspection, I certify - as a delegated Airworthiness Inspection representative of the Minister of Transport - that the performed and recorded maintenance action was accomplished correctly per the required regulations and standards of Airworthiness and the parts used / installed etc met the required regulations and standards of Airworthiness" and as such the Airworthiness of the Aircraft is not in doubt and that the aircraft is safe to fly"

If there is any "Doubt" in the mind of the Minister or the Ministers delegate holding the AME License that "the performed and recorded maintenance action was not accomplished correctly per the required regulations and standards of Airworthiness and the parts used / installed etc have not met the required regulations and standards of Airworthiness" then the Airworthiness of the Aircraft IS in doubt and that aircraft is NOT safe to fly until it does.

The flying public has been - for over the past century - directed to place their trust in the pilot, but the public has not been properly informed of the role the AME plays in aviation safety and that the pilots place their trust in the AMEs.

Pilots must be free from distraction and interference with their license responsibilities to "operate the air craft" and with all the complexities and material they must know and continuously train for, forcing them to take all of the courses and required refresher training involved with keeping 2 licenses valid would be a direct distraction.

Pilots must be able to trust that the AMEs are doing their jobs as ministers delegates correctly and completely and have complete faith in the AMEs word and signature that the aircraft is indeed airworthy and safe.

With the current dilution and degradation of the AMEs were brought to the attention of the captains - pilots in command of Canada's commercial aircraft, there can be only one possible thought going thru their minds - DOUBT.

The License the AME holds is that of a "Private Citizen Airworthiness Inspector that represents the Canadian Government at any location they are employed or happen to be within the Canadian aviation industry" - the AMEs are the "Front line eyes and ears of the Minister of Transport - and the Governor General in order to ensure that the Aeronautics Act is not violated.

The delays and non action by transport canada and the willing or unwitting undermining and subversion of the AME program by members ministers own staff who have used their positions to further not the objective of the Minister's AME cadre, but the interests of other parties or groups to which they follow or belong .

These persons and groups must be prevented from doing further harm to the AMEs now and in the future.

So great is the confusion that even seasoned AMEs do not believe or support the fact that they are ministers delegates, some willingly following that idea even when their signature is all that may prevent an un-airworthy / unsafe aircraft from being flown or a component being installed..many of who believe 'the person that signed before them for the work performed is the person responsible..... the release of the aircraft from the technical airworthiness to the operational airworthiness be it to receive the initial c of a or to return to service subsequent to maintenance and repair / modification activities is all done by a single person on the assumption that all who inspected and signed before knew what they were doing and were properly educated , vetted and licensed.

If the pilot whom is to subsequently fly the machine has doubts, so to must the AME signing the release.

The License the AME holds is that of a "Private Citizen Airworthiness Inspector that represents the Canadian Government at any location they are employed or happen to be within the Canadian aviation industry" - the AMEs are the "Front line eyes and ears of the Minister of Transport - and the Governor General in order to ensure that the Aeronautics Act is not violated.

The 100 year dis-connect / inability to trace the legislative origin of the AME with any great accuracy due to missing / inaccurate / hidden records and the now almost 100 years of wrongful education of "what an AME is" and "what an AME is supposed to do" by the false impression that they are "Mechanics" also aids in our understanding of why Canadian Lawyer John Charles Clifford was unable to determine why an AME should be a representative of the Government as an "Inspector" in his 1985 Canadian law reform society report "Inspection - A Case Study".

Mr Clifford was unable to obtain any definitive answer on why an AME was a representative of the Minister because of 2 possible reasons:

1. nobody he spoke with was educated on the background and history of the AME in Canada in order to be able to accurately answer his questions or provide documentation to support their answers as to why AMEs were Minister's delegates, or
2. those persons who he spoke with at Transport Canada or in the Private Businesses purposely withheld what they knew about the AME.

A similar error occurred in 1948 when *the Canadian Minister of Labour's tribunal* ruled that **AMEs were to be included with the rest of the trade's persons of the I.A.M.A.W.** in response to a petition from the body of the Aeronautical Engineers of Canada calling for AMEs to be identified and uniquely recognised as "professionals".

This Labour Tribunal ruling **has served to support the false belief that "AMEs are trade's-persons"** not only within the mind of the public, but also within the mind of the Canadian Government and Civil Service such as the Ministries and departments of the Treasury, HRDC, Immigration, Translation Bureau, etc.

AMEs should be seen and recognised as equals

100 years ago at the inaugural address of the Chairman of the Ontario Branch of the Engineering Institute of Canada, Professor C. R. Young, M.E.I.C, (held at the University of Toronto, Thursday October 18th, 1923) Professor C. R. Young spoke upon "The Rise of the Engineer," and reviewed the great achievements of engineers from the eighteenth century to 1923.

Following Professor Young's address, Walter J. Francis, M.E.I.C, , (president of The Engineering Institute of Canada) , spoke of the "progress of the work of The Institute" during the past two months, and mentioned "the activities of the Fuel Committee which is cooperating with Ottawa".

Mr. Francis congratulated Professor Young upon a very remarkable address, asserting that **"the welfare of a community was dependent more upon the engineer than any other citizen"**, and thought that **the engineer should not only educate the public but should tell them on every occasion how good a citizen he was.**

Mr. Francis agreed with the chairman that **"the Golden Rule was the maxim to follow"** and **"strongly advocated the elimination of competition among engineers"**.

J. M. Oxley, M.E.I.C, (vice-chairman of the branch) referred to the fact that **"the young engineer is now largely engaged in business or industrial lines"** and that ***"this tended to change or modify the professional tone"***.

J. G. Dalzell, M.E.I.C, regretted that **"the public has been so often guided on engineering matters by men without engineering qualifications"** and thought that **the members of the profession should take more part in civic affairs.**

R. O.Wynne-Roberts, M.E.I.C, ***"deprecated the combination of commercialism and professionalism prevalent to-day"*** and considered that ***"The Institute should adopt a pronounced policy in this regard."***

The above highlighted and underlined statements still apply to the education of the Public and the Minister's own staff as well as to the AMEs regarding:

1. The AME's intended legislative purpose respecting "Airworthiness" of Canadian Aircraft and Aeronautical products.
2. AME specific role and responsibility training,
3. AME certification as a Ministers Delegate to perform Airworthiness inspections and certify on the Minister's behalf.

The 100 year error

In regards to what is now known about the origin of the AME license and it's true legislative purpose - government control of civil aviation by delegated inspection and certification to ensure airworthiness - ALL of the following must be answered:

A) Why is it that TC and the public have for over 100 years been so often guided or mis-led on Airworthiness Inspection matters by persons without Airworthiness Inspection qualifications meeting the Statute requirements

B) Why is it that the Government of Canada / Transport Canada and TC's predecessors have continually failed:

1) To identify to the public (let alone itself) that the welfare of the flying community in Canada and Internationally is dependent more upon the Aircraft Maintenance Engineer to accomplish their delegated role as "Minister's Airworthiness Inspection Representative" than any other person except the Minister?

2) To educate the public (let alone itself) on every possible occasion how good a citizen the Aircraft maintenance Engineer is in keeping the Public Safe by accomplishing Airworthiness inspections and certifications ?

3) To strongly advocate for the elimination of competition among TC's Delegated "Design Engineering Representatives" (**DERs**) and TC's Delegated "Airworthiness Inspection Representatives" (**AIRs**) within Canadian Federal and Provincial legislation, publications, articles and educational references?

4) To separate the "combination of commercialism and professionalism"

- a) Commercial with the AMT being the commercial "trade Work Performer", and
- b) Professional with the AME being the Government's Licensed Airworthiness Inspection Professional.

and establish a pronounced policy to clearly differentiate these two separate qualifications and roles.

Basic vs. advanced Aeronautical Education provided to the AMEs

Dealing more particularly with the topic of "aeronautical engineering education" and the professional relationship and responsibility of the Licensed Aircraft Maintenance Engineer in accomplishing civil aviation airworthiness inspection and certification:

1. There is no finality to aeronautical engineering knowledge and personnel development,
2. There remain areas of aeronautical engineering knowledge that are unknown by and not taught to AMEs, and
3. Only by constant advance, study and practical expression can candidate and licensed AMEs fulfil their intended legislative purpose : Inspecting aircraft, aeronautical products and materials for condition and conformity, overseeing the work being performed upon aircraft, aeronautical products and materials and subsequently attesting to the airworthiness and safety of those aircraft, aeronautical products and materials in the capacity of a "Notary" to the accuracy and completion of the evidence (records and statements made by the makers, repair personnel) prior to their use or operation.

In relation to the initial and continued education and certification of AMEs, the question that must be answered in respect of the 3 questions noted above is:

Why is it that TC policy and rule-making has continually eroded and undermined the initial and continuing education of the Ministers delegated Airworthiness Inspection Representative cadre of "Licensed Aircraft maintenance Engineers" and not strengthened or reinforced it?

Strengthening the AME/Inspector curriculum

Strengthening the AME/Inspector curriculum should be prioritised included additional topic areas related to :

1. Morals & Ethics
2. Duties and Obligations
3. Aircraft Design standards and requirements

4. Aircraft maintenance program development,
5. Aircraft reliability, 6. Integrated aircraft systems,
7. technological change,
8. composites maintenance and inspection, imaging,
9. extensive coverage of computerisation,
10. core management program elements (including financial to social interactivity sensitivity, and much more.)

Civil aviation inspection and Aeronautical Engineering education has evolved into areas that weren't foreseen in 1920, let alone twenty years ago.

The concept, principles, and goals of "Aeronautical Inspection and Certification" remain the same as in 1920 and apply equally today. Albeit, with a more dynamic curriculum in line with today's aeronautical engineering background and inspection knowledge priorities.

Aviation Professionals

For our pilot brothers, who transition into higher levels of authority when the left seat is no longer attractive - or when medical status dictates a need for change, that transition is easy and fluid. There is no need for a pilot to hold a business degree as a prerequisite into management of an aviation entity - and the ATP has little value for the new area of responsibility.

The bottom line here, is that, **other than introductory levels to management training** - a pilot's "flight experience" is readily accepted as "sufficiently professional to assume management responsibilities".

On the other hand, **an AME** who, exactly like his pilot counterpart is continually required to keep abreast of:

1. changing legislative requirements for maintenance and inspection, and
2. Aircraft manufacturer's changing "maintenance and inspection requirements" on aircraft type,

is given little if any recognition for their accumulation of accrued management experience to ascend to a level higher than the maintenance floor.

Since Canadian universities ousted the AMEs from their engineering programs in the 1950's, Canada has fallen far below the educational standards of many other nations that require that AMEs take a 4 year "Bachelor degree program in Aeronautical Engineering geared specifically to Aircraft Maintenance & Inspection" with an optional / additional "Masters in Aircraft Maintenance Management" for people looking to become Directors, or VP's of Maintenance.

Such degree programs should be a requirement to hold an AME licenses and would address both a real operational need in the industry, as well as the long overdue recognition that is commiserate with expected management levels of maintenance inspection responsibility, accountability and credibility.

From 1924 until the mid 1950's the University of Toronto was one of the Universities that did teach the academic portion of the "theoretical knowledge" in Aeronautical Engineering to candidate AMEs.

Records of that curriculum exist in the U.of T. archives as well as online.

If you were to count up all of the hours of technical and documented exexperience training required of an AME, before sitting their federal TC AME exams - the aggregate of that structured training should easily outweigh either of a typical Bachelor's or Master's Degree, however without the program of AME training being elevated above that of a "College Level" nothing will change in regards the AMEs current malaise related to AME recognition and status amongst the members of "other professions" such as Pilots and P.Eng.

"Professional Pilots" and "P. Eng. design personnel" are highly trained and well respected, BUT they are not "more special or more superior" to that of any of your cadre of professional AMEs.

They are different, and so are the AMEs.

Not better: Just different.

As such, every "professional" plays different roles in the regulatory safety regime.

- A. Design Engineering by a P.Eng is "engineering design".
- B. Engineering Maintenance Inspection by an AME is "maintenance inspection".

Two different worlds that work together or independently.

Working together - design engineering is a sub-function of maintenance control to support the AME.

Working Independently - design engineering is engaged in design approval as a stand alone function or entity.

Current University engineering programs for "Design Engineers" focus on subject matter that confirms that "once completed", the graduate will be widely versed in areas of the specific area of engineering design:

- a) stress,
- b) fatigue,
- c) metal and composite strength properties,
- d) metallurgy,
- e) compliance programs,
- f) failure modes,
- g) damage tolerance criteria assessment standards, and
- h) other such knowledge-based theory used to approve designs and manufacturing processes.

all of which are essential subject-matter for their profession as aeronautical designers.

But none of those subjects or topics on "Design Engineering" have any bearing on the unique education and training required to accomplish "the supervision, inspection and certification of aircraft during manufacture and maintenance" or on "what is required to meet the regulatory requirements for accomplishing the manufacturing and maintenance release requirements" associated with the privileges delegated to a qualified AME.

The basics of two similar University Engineering programs (Aeronautical Design Engineer vs. Aeronautical Inspecting & Certifying AME) could be similar - but with a focus shift in the 3rd or 4th year of the program.

In fact this would return the AME educational program to how the original Canadian University education programs for AMEs was delivered between 1924 and the mid 1950's, especially if credit were given to persons who held an AMT certificate that went thru a basic aeronautical science and theory program in college who could be exempted from a great portion of an entry level University Bachelors' degree program for educating "AMEs" in aeronautical science and theory.

Being accredited as an AME by the Minister is a major achievement in its own right - and in my view, requires education and recognition equivalent to those carrying B.Sc or BA degree status earned from a college or university in the academic world.

In 1919/1920 a document known widely as the "Trenchard Memorandum" was written by the Chief of the British Air Staff and subsequently introduced to the British parliament by the Secretary of State for Air - your counterpart of old.

That memorandum dealt with many important issues. Part 5, 6 and 7 of the memorandum dealt the extreme importance of Military aviation training. Training not specific to pilots, but those upon whose abilities airworthiness and safety ultimately depends.

Extreme importance of training

Trenchard Memorandum part 5. "Extreme importance of training"

"We now come to that on which the whole future [...] depends, namely, the training of its officers and men. The present need is [...] is first and foremost the making of a sound framework on which to build a service, which while giving us now the few essential service squadrons, adequately trained and equipped, will be capable of producing whatever time may show to be necessary in future ..."

Sadly the Trenchard memorandum has been overlooked in relation to "training Officers and Men of the technical Staff" from which the Canadian Air Board and "Civil Air Service" drew its members. I say this because the intent at that time is still valid today for the multitude of AME training subjects and concerns.

The Trenchard memorandum - rarely seen - is a worthwhile read, a copy may be downloaded from: <https://archive.org/details/PermanentOrganizationOfTheRoyalAirForce1919>

Where we are today

The past 100 years of confusion and mis-understanding that has been widely spread regarding AMEs as being "just mechanics" or "mechanics only" has clouded the origin and legislated role of the AME in the mind of the public and of Canadian Politicians. Time and again this confusion

and misunderstanding of "the AME" by the public and Government only ends in accident, injury and death.

AMEs are private citizens accomplishing a delegated role as a licensed Airworthiness Inspection Representative (A.I.R) of the Government of Canada in accordance with the Aeronautics Act. All of what I have uncovered over the past 15 years of research and investigation fully supports Justice Moshanky's Dryden Air Accident report statement "the AIR need to be reinforced".

In the instance an AME exercises their Ministerial delegated / authorised privileges certifying aeronautical products on behalf of the Minister, they are not a technician, mechanic, handyman, or any other "titled trades person".

The person holding the AME license may be all, or some of those while conducting maintenance to meet a certification or maintenance requirement for their "industry employer" that then leads to an Airworthiness Inspection and release, but AMEs are never one of those trades people while they accomplish the inspection of that work and issue a release on behalf of the Minister that returns "the aircrafts status" once again to "Airworthy" - whether it is an inspection and certification/release of trade's-work that the license holder performed personally, or an inspection and certification/ release of someone else's trades-work.

In the instance when an inspection and certification/release is being accomplished to either support a new airworthiness certification or an in-service certificate of airworthiness, the Person who is inspecting and certifying is acting as a Licensed Aircraft Maintenance Engineer: a member of the Ministers' Cadre of AMEs accomplishing a delegated role as a licensed Airworthiness Inspection Representative (A.I.R) of the Government of Canada in accordance with the Aeronautics Act.

All of which I have related supports the need for better, additional and continued AME education and training be delivered and/or supported by Transport Canada. Further, the Hon. Justice Moshanky's Dryden Air Accident report Vol.3 included a statement that "the AIRs need to be reinforced" which has yet to be acted upon by Transport Canada - indeed the very opposite has occurred.

Dryden occurred in 1987 and yet the exact same conditions and situations which lead to that accident still exist and are reflected not only in Canadian TSB aircraft accident reports issued between 1987 and today but the recent Canadian TSB air accident investigation of a 2017 ATR-42 crash clearly identifies that Canada's AMEs and their training program need to be reinforced.

Dependency upon Safe and Airworthy Aircraft / Aeronautical Products

Canada depends on Airworthy and Safe aircraft and Canada has led the world in Aviation Maintenance Safety for many years largely because the AMEs in the system wound up knowing more than what was being delivered in their basic training program thru tribal knowledge and the People holding the Licenses refuse to let non-airworthy aircraft fly... but that situation of education thru tribal knowledge can no longer continue because too many experienced and knowledgeable AMEs are leaving the industry and taking their vast wealth of experience and knowledge with them before it can be communicated to the new AMEs entering the industry after graduating a broken AME training and accreditation program.

If there is any "Doubt" in the mind of the Minister or the Ministers delegate holding the AME License that "the performed and recorded maintenance action was not accomplished correctly per the required regulations and standards of Airworthiness and the parts used / installed etc have not met the required regulations and standards of Airworthiness" then the Airworthiness of the Aircraft IS in doubt and that aircraft is NOT safe to fly and cannot be released until it does.

Time for action or lose the AMEs forever

The People of Canada and many other nations who:

- A. Fly upon Canadian Aircraft,
- B. Fly upon aircraft maintained by Canadians and
- C. who use aircraft and aeronautical products built in Canada and/or maintained by Canadians

depend upon the Minister to ensure that only the smartest, wisest, most highly educated and practically experienced Aeronautical Engineering personnel within Canadian Aeronautics with a well rounded understanding regarding:

1. Initial and continuing airworthiness requirements,
2. Aircraft airworthiness design criteria that must be adhered to,
3. Initial and in-service Airworthiness inspection requirements, and
4. Adherence to government, industry and manufacturer standards

that Canada can educate and deliver, are presented to the Minister as candidates for membership in the Minister's Cadre of privately licensed Airworthiness Inspection Representatives, the Ministers Cadre of "AMEs".

Transport Canada must properly reinforce the Minister's Airworthiness Inspection Representatives (AMEs) as Justice Moshansky said was required 34 years ago because no doubt in the Minister's AMEs should ever exist.

Steve Chamberlain

Licensed AME

20 November 2021

Appendices to the background on AME Origin and Purpose

Appendix A : Effects of Shortage of AMEs

(1) Risks resulting from effects of Shortage of AMEs and incorrect training of AMEs on Canadian Business:

a) Certification of incorrectly selected, trained and qualified applicants:

- i. Only trained to be a mechanic (i.e A&P mechanic).
- ii. Not trained / qualified to be an Airworthiness inspector.
- iii. Not trained to supervise others.
- iv. Not trained to say NO, but instead will sign for anything, not trained to represent the Minister as a signatory.

b) Work gets performed incorrectly:

- i. repairs fail in service once out the door
- ii. people injured (or worse)

c) Incorrect / non-conforming materials are accepted and subsequently used:

- i. repairs fail in service once out the door
- ii. people injured (or worse)

d) Incomplete / inaccurate aircraft records are notarised by the AME:

- i. inability to verify who did what and when.
- ii. records retained are inaccurate or misleading
- iii. records reflect entire chapters were accomplished when this is not the case
- iv. records of work performed and certified by other organisations may not be on file (because most AMOs do not supply these detailed documents to the aircraft owner along with the Form One / 8130-3)
- v. Company may have to account for costs for work linked to them that they cannot refute.

e) Aircraft certified and returned to service that are not airworthy:

- i. foreign ramp check catches issue - aircraft grounded in foreign country.
- ii. Parts / material liberated from aircraft in flight i.e Blue Ice / Turbine engine parts / cowlings
- iii. incident occurs (injuries and property damage)
- iv. accident occurs (death and substantial property damage)

f) Impact to Company revenues:

- i. Buy-back / Warranty
- ii. Penalties for failing to meet on-time delivery
- iii. having to defend against Civil suits and Criminal cases

g) Impact to Company reputation:

- i. Bad work reputation
- ii. revolving door of employees coming / going
- iii. Good AMEs and AMTs do not want to work for you
- iv. errors not caught before delivery to customer
- v. TSB and similar reports made public

(2) Resulting Challenges to Canadian employers / businesses :

a) Locating qualified AMEs:

- i. ICAO equivalent is not what it appears to be. (ICAO says A&P = AME" this is false).
- ii. Canada' Immigration portal informs potential immigrants that an "A&P" will be acceptable for getting an AME.
- iii. Canada's HRDC NOC Codes for AMEs are inaccurate and merge the Mechanic with the Airworthiness Inspector.
- iv. Transport Canada program designed *with the intent "to produce a fully qualified technician"* (Canada's Federal Government is not allowed by BNA to qualify trades-persons) *"with the expectation* that they will fulfil the role of the AME" in Canadian aviation.
- v. Current Canadian College program focus has shifted from **training inspectors / certifiers** to *training trades-persons*.

- vi. Canadian Colleges graduating students for PROFIT, thus colleges may be lowering the standards for entry and graduation in order to attract potential students. Graduates must meet strict entry and graduation terms, no cheating accepted. Graduates must not be "certified" by the colleges as meeting TCCA standards as this is a conflict of interest identical to what has occurred in the USA in the mid 1990's and 2000's.
- vii. Potential for Canadian licensed AMEs to obtain a derogation / license in a foreign jurisdiction as an "inspector" and then inadvertently cause incident / accident on foreign registered aircraft due to improper training / licensing structure received in Canada.

b) In order to Ensure AMEs are properly trained and capable:

- i. Require college entrance requirements contain stipulations for "high-school technical education".
- ii. Require that colleges shift the level of academic & required for entry to a higher level.
- iii. Require College entrance requirements to mandate 75% or better in "Technical" english.
- iv. Require candidates for employment to hold provincial trades board issued "Aircraft Mechanic Certificates" issued subsequent to trades testing.
- v. Require and accomplish trades testing of applicants prior to certification
- vi. Require and accomplish english testing at an engineering level prior to certification.
- vii. Verify that the person is who they say they are and that their licenses are in fact legitimate. (i.e - Pakistan and counterfeit Pilot / AME license issues resulting from 737MAX investigations)

(3) Resulting Opportunities presented :

- A. Re-enforce Canada's AME training program and strengthen Canada's weakened position on Airworthiness Control.
- B. Canada can continue to Stand out above the crowd as a leader instead of a follower.

(4) strategies to effect significant cultural change regarding AMEs:

- A. Educate the AMEs as to what they truly are and of what is expected of them as license holders regarding Condition and Conformity Inspections for Airworthiness compliance.
- B. Show the AMEs that your bottom line as well as their paycheque and continued employment rides on them.
- C. Report ALL non-conformances and issues toed to "findings" reported or made in the company that are directly / indirectly linked to AME training and Licensing to TC because otherwise the company will spend tens of thousands of dollars trying to fix a problem it didn't create.

Appendix B : Potential Risks

Potential Risks resulting from the current TC accredited policy, standards, model of training / qualifying AMTs and AMEs in Canada:

1. Education of AMEs to fulfill the original intended role is undermined:

- Only trained to be a mechanic (i.e A&P)
- Not trained / qualified to be an Airworthiness inspector
- Not trained to supervise others
- Not trained to say no, but instead will sign for anything
- Not trained to act as a representative of the Minister.
- AMEs are currently viewed by the masses as "mechanics" performing trade's-work instead of being viewed as Highly educated and trained Professionals performing a regulated function as Certifying Inspecting Engineers, this needs to be addressed because aviation safety relies upon the AME as the final technical sign off before the pilot flies the aircraft.
- As Aeronautics Engineering knowledge advances , AMEs now get less and less of that knowledge with an expectation that they know more and more...
- AME's being allowed to certify aircraft of any size and complexity when they do not understand / fully comprehend the machine, its systems, its design specifications or the required regulatory standards to be met in order to certify it is compliant.
- No longer a progressive education and no pre-requisites or additional certification structure that requires AMEs to enter at a level commensurate with their knowledge & experience and then advance upwards or sideways.
- Results in Industry hiring incorrectly trained and qualified personnel.
- The wide ranging sizes and complexities of aircraft, engines and other aeronautical products on the Canadian Register require that considerable practical experience and theoretical knowledge is necessary prior to AME licensing to ensure that the licensed AME will not make serious mistakes for lack of knowledge of what they are doing.
- Business and aircraft owners seek to bypass the period of training and experience required for candidates to become thoroughly knowledgeable and then obtain AME licenses, and yet those businesses / aircraft owners and the public hold those candidates / license holders accountable when things go wrong.
- Once graduated from their basic training programs, candidate AMEs must have acquired sufficient general knowledge and experience to ensure that they are competent to judge whether aircraft of all types applicable to the license they seek to obtain are safe to fly.
- The Public sees newly licensed AMEs with the same eyes it sees seasoned and knowledgeable AMEs, therefore the public demands that candidate AMEs require intimate knowledge of the particular type of aircraft or engine etc. for which their licence is to be rated / endorsed.
- The Public expects that the candidate AME must have maintained the particular type of aircraft for which his licence not only as a "Certified Competent Technician" as a prerequisite to holding an AME License, but that the candidate has also; in addition, separately accomplished and recorded the accomplishment of the specific duties and responsibilities of an AME related to supervision, inspection and certification of those maintenance tasks. However there is no differentiation made in candidate logbooks of "Maintenance Performed" vs "oversight inspection performed" tasks

2. Perception of AMEs by NON-AMEs / other Professionals is diminished or altered:

- Educators teach incorrect information in Colleges and Universities about the role and responsibilities of AMEs
- Government employees incorrectly edit or alter department documents related to policy, standards or definitions.
- Government's Translation Bureau terms and definitions reflect inaccurate information.
- Immigration Policies and Labour Relations references are impinged, degraded or incorrect.

3. Maintenance Work gets performed incorrectly without being corrected:

- repairs fail prior to delivery to customer and require rework
- repairs fail in service once out the door and require warranty work
- people injured (or worse) when repairs are incorrectly performed and certified.
- Incorrect / non-conforming materials are used:
- repairs fail in service once out the door • people injured (or worse) .
- Incomplete / inaccurate aircraft records are notarised by the AME:
- inability to verify who did what and when.
- records are misleading
- records reflect entire chapters were accomplished when this is not the case

- records of work performed and certified by other organisations may not be on file (because most AMOs do not supply these detailed documents to the aircraft owner along with the Form One / 8130-3)
- Company may have to account for costs for work linked to them that they cannot refute.
- TSB and other investigators are increasingly unable to obtain full details from aircraft owner of exactly what maintenance was performed / parts used / maintenance references used etc. in order to conduct effective investigations when components have failed or other work was subsequently accomplished during installation.

4. Aircraft returned to service that are not / may not be airworthy:

- foreign ramp check catches issue - aircraft grounded in foreign country.
 - Parts / material liberated from aircraft in flight i.e Blue Ice / Turbine engine parts / cowlings
 - incident occurs (injuries and property damage) • accident occurs (death and substantial property damage)
6. Impact to private Company revenues:
- Buy-back / Warranty • Penalties for failing to meet on-time delivery • Revenue lost to cover restitutions imposed by legal judgements / rulings • Bankruptcy
7. Impact to private Company reputation:
- Bad work reputation • revolving door of employees coming / going • errors not caught before delivery to customer. • Consumer loses confidence that company is compliant, takes work elsewhere.

5. Impact to Government of Canada / Transport Canada / Minister of Transport

- Failed Government policy,
- Lack of control over internal staff advising the minister and others
- Errors not caught by AMEs as intended by legislation before accidents happen.
- Loss of public trust in Parliament & Transport Canada to control airworthiness.
- Loss of trust in Canada's Aviation Safety program.
- Exclusion of Canadian aircraft into foreign airspace due to concerns of foreign regulators over airworthiness of Canadian aircraft / products.

Appendix C : Opportunities presented to support and reinforce the AME

Opportunities presented for Improvement to Canada's AME training programs:

1. Introduce a 2 stage training and licensing structure for Canadian AMEs:

a) Aircraft mechanic / AMT 1st, - a mandatory pre-requisite - with a defined period of time between obtaining the AMT certificate before they can attend AME training. - In the exact same manner as American A&P's.

b) AME 2nd, in the exact same manner as American DAR-Ts / DAR-F (I.A's)

2. Introduce the term "Licensed AME" into the Aeronautics Act, Section 3 Interpretation and and define it correctly: "Means a Minister's Delegated Airworthiness Inspection Representative having responsibility and authority for the airworthiness inspection and and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations.

Similar to the U.S.A, allow AMEs to negotiate the fee they charge for their services in addition to their wages if they also work as certificated AMTs.

3. Introduce the term "Licensed AME" into CARs PART 1, Subpart 1 Section 101.01 and define it correctly: "Means a Minister's Delegated Airworthiness Inspection Representative having responsibility and authority for the airworthiness inspection and and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations".

4. Introduce the term "AMT" into CARs PART 1, Subpart 1 Section 101.01 and define it correctly: "Means a Trades-person (mechanic) Certified Competent to perform aircraft maintenance and repair in preparation for inspection and certification"

5. Introduce firm, standards, policies and procedures to be met by candidate Aviation Maintenance technicians (AMT's) within CARs and authorise that post training certification to those standards etc is to be accomplished by Provincial Trade Boards to harmonized RED Seal standards and that aviation maintenance trade's certificates are to be issued by the Provinces to those who successfully pass their Provincial oral, practical and theoretical trade testing exams.

6. Define and implement higher academic and technical background standards to be met by persons seeking entry into a Canadian Aviation Maintenance technician (AMT) training programs out of Canadian high-schools or as direct entry candidates.

7. Define and implement higher academic and technical background standards to be met by persons seeking entry into a Canadian Aviation Maintenance Engineer (AME) training programs out of Canadian Colleges and Universities or as direct entry candidates from industry.

8. Properly re-establish the AME as a proper "Airworthiness Inspection Representative" / A.I.R and Ministers (external) delegate.

9. Clearly define the specific roles / responsibilities of the AMEs as delegated persons having responsibility and authority for the airworthiness inspection and and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations.

10. Due to "Mechanics" now training AME candidates to become "Mechanics", require that the candidates for an AME license must receive - in addition to their theoretical education as AMEs, hands-on OJT training as "*Supervisors, Condition and Conformity Inspectors, delegates and notaries*" **and** successfully complete a certain number of mandatory required **condition / conformity / first article inspections** within manufacturing and/or maintenance environments (depending upon the rating sought) under the direct supervision of an AME properly educated and certified to act in the correct capacity.

11. Re-introduce a candidates handbook for the AMEs that specifies what they can and cannot do. Also, introduce written contract to be signed between the Minister and the Delegate clearly

defining what the licensed delegate is accountable and responsible for including the full terms of and extent of their authority.

12. Enable the AMEs to charge or otherwise negotiate a fee for their services with their employers by recognition of their Professional "Delegated Airworthiness Representative" status in the exact same manner that the USA allows for its' DARs to be compensated for their work.

13. To directly reflect their American counterpart, re-identify the Canadian term for Design Engineering Representatives to "DE" and not DAR as is currently the case.

14. Define the Canadian DAR to directly and correctly reflect its American counterpart.

15. Re-enforce Canada's AME training program and strengthen Canada's weakened position on internal Airworthiness condition and conformance control.

16. Stand out above the crowd as a leader instead of a follower and take positive action to support Canada's AMEs as "CASI's-Private" in support of Canada's commitment to ICAO's framework for airworthiness which requires these license holders to be in place.

17. Re-define the term "Maintenance" to exclude "Inspection" and any references to "Inspection certification". Inspection is inspection but "maintenance" is work that is done in order to prepare an aircraft or aeronautical product for inspection.

18. Require that the TSB sanitise, but report out on ALL issues effecting aviation safety including information gleaned during TSB laboratory analysis of repairs made by Canadian certificate holders and subsequently inspected / certified by Delegates.

19. Alert the Treasury that "TIs within the Minister's office doing Civil aviation related work need to be identified as requiring both an AMT certificate of competency as well as an AME License.

20. if the Candidate for an AME candidate is a Military trades'-person, that they take the same AME training as all other AMEs and accomplish OJT in the capacity of a civilian inspection delegate before they are issued a license.

21. Amend the current CAR 566.07 Alternative Training Provisions respecting "Foreign Applicants" to state "Foreign Applicants who HOLD a valid Delegated Airworthiness Representative "Inspection Authorization" issued by the US Federal Aviation Administration, are exempt from the basic training requirement specified in Appendix A but must keep their I.A active"

Appendix D : Strategies to effect significant cultural change

Strategies to effect significant cultural change within Government, Industry and the Public regarding AMEs:

1. Educate the AMEs as to what they truly are and of what is expected of them as delegated license holders regarding Condition and Conformity Inspections for Airworthiness compliance.
2. Support the meshing of AME training at the College level with the University Engineering education so that there is a clear link and ability for upward progression for AMEs to attend University level courses ,

3. Require Licensed AMEs to become members of an "Professional Aeronautical Engineer's Association" (which must not be a trades' union or a trade's union association) that is supported and acknowledged by the Provincial Engineering associations to enable the AMEs to progress onwards to earn a "P.Eng in Aeronautics" as an additional credential once they have successfully:

1. graduated their basic training College programme,
2. obtained the AME license and
3. have satisfied additional education requirements which should be offset by their type training and years of experience.

4. Require Canadian programs of "University Level Aeronautical Engineering" that further develop AMEs to:

- A. recognise the AME license(s), experience and type training, and
- B. be delivered on-line thru recognised / accredited Universities distance education programs..

4. Show the AMEs that their private employer's bottom line as well as their paycheque and continued employment rides on the AMEs themselves.

5. Amend the current TC SMS policy to require all SMS participants to report ALL non-conformances and issues related to "findings" reported or made in the company that are directly / indirectly linked to AME training and Licensing to TC.

6. Amend current TC SMS policy to reflect that TC, as an employer of "Delegates" must also adhere to its own SMS policies for TC's "external" Employees - the Minister's delegates..

7. Require TC to prepare and deliver ongoing refresher and update training to AME license holders specific to:

- a) Aeronautics Act and CARs
- b) TC Regulations, Policy, Standards, Ministers MSI's,
- c) the AME's role and function as a Ministers' delegate for Airworthiness inspection and certification and d) the requirement for AMEs to adhere to regulatory standards etc.

8. Similar to the USA for it's I.A's / DAR-T and DAR-Fs, publish a monthly or semi-monthly list of Valid / Active AMEs (not AMTs) that is publicly visible and tied into their 2 year refresher training courses which must be delivered by or acceptable to the Minister.

9. Publish detailed factual information that identifies and establishes the legal origin and evolution of the AME stemming from the British birth-certificate as "Aeronautical (Ground) Engineers" in 1919 thru the change in terminology used by the Canadian Air Board in 1920 as "Air Engineers" to the subsequent re-naming of Canada's Air Engineers in 1946 to today's Licensed Aeronautical (maintenance) Engineer to today's Licensed Aircraft Maintenance Engineer.

Require that this important background information be included and taught:

- a) to both AMTs and AMEs in order to better reinforce the AME program, and
- b) to the public that they can correctly understand and trust the AME program.

Appendix E : AIR MECHANIC Certificates and AIR ENGINEERS' Licenses

AIR MECHANIC Certificates and AIR ENGINEERS' Licenses – as should have been communicated by the Air Board to license holders and the public in 1920. This should have been used from then on and could now be amended to reflect "Current" terminology – (NOTE this is an ongoing W.I.P as more factual information is obtained related to the training and licensing of Aeronautical Ground Engineers / Air Engineers - Steve Chamberlain 2018)

Conditions of issue and Instructions to applicants

a) DEFINITIONS

- (a) "Minister," in these instructions, means the Minister of Transport.
- (b) "Air Engineer," in these instructions, means a person who is the holder of an Air Engineer's Certificate issued by the Minister of Transport authorizing him to act as therein specified.
- (c) "Air Mechanic," in these instructions, means a person who is the holder of an Aircraft Mechanics Certificate of Competency issued by a Provincial Trades' certification Board in meeting the requirements as laid down by the Minister of Transport authorizing him to act as therein specified.

b) Air Engineer License Categories

Air Engineers' Certificates will be issued subject to the provisions of Air Regulations, for any or all of the following purposes:

- A. Inspection of aircraft before flight.
- B. Inspection of aircraft after overhaul.
- C. Inspection of aero engines before flight.
- D. Inspection of aero engines after overhaul.

c) Air Mechanic Categories

Air Mechanic Certificates of Competency to perform the work in their trade will be issued, subject to the provisions of the Air Regulations, by Provincial Trades certifying boards for accomplishing the work required during routine maintenance, overhaul, modification and manufacture related to:

- (a) Airframe repair / modification / maintenance
 - (b) Aero-engine repair / modification / maintenance
 - (c) Airframe & Engine repair / modification / maintenance
 - (d) Electrical, Radio, Compass repair / modification / maintenance
- performed that renders the aircraft or engine ready for inspection in order to either
- 1. receive an initial airworthiness certificate, or
 - 2. re-activate an existing airworthiness certificate

d) QUALIFICATIONS Required to hold an Air Mechanic's Certificate of Competency

In order to qualify for an **Air Mechanic's Certificate of Competency**, a candidate must,

- (a) Not be under 16 years of age.
- (b) Satisfy the Minister by examination or otherwise as to his ability.
- (c) Be able to demonstrate sufficient ability in the use of appropriate tools and materials that would be necessary to enable him to perform such repairs and replacements as his duties in maintenance of aircraft and/or aircraft engines **might** require.
- (d) Furnish the names and addresses of 3:
 - a) employers engaged in the manufacture, modification or repair of aircraft and/or aircraft engines; or engaged in the operation of aircraft, OR
 - b) licensed air engineerswho can, from direct personal knowledge, vouch for the proficiency of the candidate in:
 - a) the quality of their workmanship,
 - b) their ability to correctly perform the tasks required,
 - c) their character.

e) QUALIFICATIONS Required to hold an Air Engineer's License

In order to qualify for an Air Engineer's Certificate, a candidate must,

- (a) Hold an Air Mechanic's trade certificate of competency
- (b) Be able to demonstrate sufficient ability in the use of appropriate tools and materials that would be necessary to enable him to perform such repairs and replacements as their duties in maintenance of aircraft and/or aircraft engines for their private employer **might** require.
- (c) Be a Canadian Citizen, or a subject of a foreign country which grants reciprocal aeronautical privileges to Canadians on equal terms and conditions with subjects of such foreign country.
- (d) Not be under 21 years of age.
- (e) Satisfy the Minister by examination (or otherwise) as to their knowledge and ability as an delegated inspector – certifier of aircraft maintenance, repair, overhaul modification and/or manufacture on behalf of the Government of Canada.
- (f) Be able to demonstrate sufficient ability in:
 - a) Selecting and understanding the correct legislative documentation (known as a regulatory "technical instrument") applicable to the aircraft / engine / component being built / maintained / repaired / modified in order to ensure correct certification of said item
 - b) their use of regulatory, manufacturer or other approved design documents that would enable them to perform inspection and certification of such repairs and replacements as their administrative duties on behalf of the Government of Canada in the certification of the maintenance of aircraft and/or aircraft engines owned / operated by their private employer **might** require.
- (g) Furnish the names and addresses of three (3):
 - a) **employers** engaged in the manufacture, modification or repair of aircraft and/or aircraft engines; or engaged in the operation of aircraft, and
 - b) **licensed air engineers** who can, from personal knowledge, vouch for the proficiency of the candidate in:
 - d) their quality of work,
 - e) their attention to detail,
 - f) their character,
 - g) Their aptitude in aviation safety.

f) EXPERIENCE required by Air Mechanic Candidates

Candidates for Provincial Air Mechanic certificates of competency are required to submit proof of having completed either a combination of or all of:

1. a 3 years' apprenticeship in the foundation Trade of Aircraft Mechanic performing a combination of maintenance, repair, modification and overhaul tasks.
2. a 1 years' apprenticeship **extension** in the Trade of Aero-Engine Mechanic performing a combination of maintenance, repair, modification and overhaul tasks.
3. a 1 years' apprenticeship **extension** in the Trade of Aircraft Mechanic – Electrical, radio and compass performing a combination of maintenance, repair, modification and overhaul tasks.

In all categories, the Certificates of Competency issued will be limited to the specific areas in which the candidate has apprenticed and gained experience.

g) EXPERIENCE required by Air Engineer Candidates

- (a) Candidates for certificates in category "A" will be required to submit proof of having had at least two years' satisfactory experience as an apprentice/candidate Inspecting / Certifying engineer on both aircraft construction and maintenance, or on maintenance alone.
- (b) Candidates for certificates in category "B" will be required to submit proof of having had at least two years' satisfactory experience as an apprentice Inspecting / Certifying engineer on aircraft construction and maintenance, or on construction alone.
- (c) Candidates for certificates in category "C" will be required to submit proof of having had at least two years' satisfactory experience as an apprentice Inspecting / Certifying engineer on aero engine construction and maintenance, or on maintenance alone.
- (d) Candidates for certificates in category "D" will be required to submit proof of having had at least four years' satisfactory experience as an apprentice Inspecting / Certifying engineer on aero engine construction and maintenance, or on construction alone.

In all Air Mechanic and Air Engineer categories, the Certificates and/or Licenses issued will be limited to those types of aircraft / engines of which the candidate direct personal experience.

h) SCHOOL TRAINING – Theory & Practical - Air Mechanic Candidates

- (a)** Graduation from High school with a minimum 70% pass mark in the following subjects (Theory and Practice) is required as entry level foundation into College level technician / mechanic programs:

- a) English comprehension
- b) Mathematics
- c) Chemistry
- d) Visual Arts (Drawing / painting)
- e) Physics
- f) Drafting & Blueprint
- g) Machine shop
- h) Automotive shop
- i) Wood shop
- j) Paint Shop
- k) Electrical Shop

- (b)** Graduation from a Canadian College education program (or like institution) in Aircraft Maintenance with a minimum 70% pass mark in the following subjects (Theory and Practice) is required to obtain an aircraft mechanics' certificate of competency :

- a) Drafting & Blueprint
- b) Machine shop
- c) Automotive / engine shop
- d) Wood shop
- e) Paint Shop
- f) Electrical Shop

1. High School education and Practice may be permitted to count towards the experience required for an Air Mechanic's Certificate of Competency under the following conditions:-

- (c) A student having completed a TC accredited 2 year Aircraft Apprentice's course at a Canadian High School may, on graduation from the school, be credited with "hours spent" in the aircraft and aero engine shops of the school performing "practical trades work" towards an Air Mechanics' certificate. Such time may not exceed a credit of one-half year.
- (d) A certificate of competency relative to the candidate's qualifications will only be accepted from a licensed engineer in the employ of such school and the hours of practical shop work must be verified by the principal of the school or his assistant.

2. College level theoretical education and practice in aircraft maintenance may be permitted to count towards the experience required for an Air Mechanic's Certificate of Competency under the following conditions:-

- (e) A student having completed a TC accredited 2 year Air Mechanic's course at a Canadian College may, on graduation from the school, be credited with the actual hours spent in the aircraft and aero engine shops of the school performing "practical trades work" towards their Air Mechanics' certificate. Such time may not exceed a credit of one year.
- (f) A certificate of competency relative to the candidate Air Mechanic's qualifications, abilities and skill to perform work will only be accepted from a licensed engineer in the employ of such school and the hours of practical shop work must be verified by the principal of the school or his assistant.
- (g) The balance of the four (4) years' apprenticeship experience required for an Air Mechanic's Certificate must be completed in full while performing maintenance, repair, overhaul and/or modification tasks on aircraft / engines / components under the direct supervision of a licensed air engineer.

i) SCHOOL TRAINING – Theory & Practical - Air Engineer Candidates

(a) Time spent at Aircraft maintenance Colleges or like institutions:

- a. **may** be taken under consideration when assessing the candidate's practical experience in the performance of maintenance, and
- b. **may** be permitted to count towards the experience required for accomplishing supervision / inspection / certification of maintenance required for an Air Engineer's Certificate under the following conditions:-
 - a) A student having completed a distinct Air Engineer's course at a technical school or like institution may, on graduation from the school, be credited with the actual hours spent in the aircraft and aero engine shops of the school acting in a supervisory / inspecting capacity over aircraft maintenance technician students at the same school. Such time may not exceed a credit of one year and will only apply to "Line Maintenance" licenses only.
 - b) A certificate of competency relative to the candidate's work and qualifications as an inspector/certifier will be accepted from a licensed engineer in the employ of such school as course director and the hours of practical inspection and supervisory work in the shop must be verified by the principal or his assistant.
 - c) The balance of the candidates' two years' inspection / certification apprentice experience required for issue of an **Air Engineer's Certificate** must be completed **in full** while performing inspection and certification tasks for their employer under the direct supervision of a licensed air engineer, and must be verified by the Quality / Airworthiness manager or his delegate.
 - d) No part of any high School or College "work" as an inspector / certifier will be admitted as qualifying a candidate Air Engineer for a license to certify work performed during "Heavy" or "Base" Maintenance.

(b) Time spent at Canadian Universities or like institutions:

- c. **WILL NOT be taken under consideration when assessing the candidate's practical experience in the performance of aircraft maintenance, and**
- d. **May** only be permitted to count towards the experience required for accomplishing supervision / inspection / certification of maintenance required for an Air Engineer's Certificate under the following conditions:
 - a) A student having completed a distinct Air Engineer's 3 year course at a Canadian University or like institution may, on graduation from the school, be credited with the actual hours spent in the aircraft and aero engine shops of the school acting in a direct supervisory / inspecting capacity over aircraft Maintenance students at an affiliated aircraft maintenance school. Such time may not exceed a credit of one year.
 - b) A certificate of competency relative to the candidate's work and qualifications as an inspector / certifier will be accepted from a licensed Professional engineer holding an Air Engineer's certificate in the employ of such school as course director and the hours of practical inspection and supervisory work spent in the aircraft maintenance schools' shop must be verified by the principal or his assistant.
 - c) The balance of the candidates' two years' inspection / certification apprentice experience required for issue of an **Air Engineer's Certificate** must be completed **in full** performing inspection and certification tasks for their employer under the supervision of a licensed air engineer, and must be verified by the Quality / Airworthiness manager or his assistant.
 - d) While the "Theoretical knowledge" delivered by the institution in engineer foundation and inspection / certification is accredited, No part of any school "work" as an inspector / certifier will be admitted as qualifying a candidate Air Engineer for a license to certify Theyavy" or "Base"

maintenance. All work related to the inspection / certification of “Theyavy” or “Base” maintenance must be accomplished during a supervised apprenticeship in this role for the candidates’ employer.

- (c) Graduation from distinct “Air Mechanic’s” education program delivered by a Canadian College or like institution with a minimum 70% pass mark in the following subjects (Theory and Practice) **Is required for certification as an “Air Engineer”**:

- a) English comprehension
- b) Mathematics
- c) Chemistry
- d) Visual Arts (Drawing / painting)
- e) Physics
- f) Drafting & Blueprint
- g) Machine shop
- h) Automotive shop
- i) Wood shop
- j) Paint Shop
- k) Electrical Shop

(d)

- (e) Graduation from distinct “Air Engineer’s” education program delivered by a Canadian University, College or like institution with a minimum 70% pass mark in the following subjects (Theory and Practice) **Is required for certification as an “Air Engineer”**:

- a) English comprehension
- b) Mathematics
- c) Chemistry
- d) Visual Arts (Drawing / painting)
- e) Physics
- f) Drafting & Blueprint
- g) Machine shop
- h) Automotive shop
- i) Wood shop
- j) Paint Shop
- k) Electrical Shop

j) APPLICATIONS for Air Mechanics’ CERTIFICATES of Competency

- (a) Application forms may be obtained on request from:

- a) Civil Aviation Inspectors at the various District offices, or from
- b) the Civil Aviation Division, Department of Transport, Ottawa.

- (b) Applications for Certificates cannot be considered unless sufficient information is given in either the application or letters of competency concerning the candidate's experience on different makes and models of aircraft and aero engines.

- (c) For Mechanic’s A or C license applicants, complete details of the applicant are required, both in the application and letters of competency provided in support of their abilities as a repair technician:

- a) stipulating the length of time connected with the aircraft industry on maintenance duties,
- b) specifying the makes and models on which satisfactory work has been done.

- (d) For Mechanic’s B or D license applicants, complete details of the applicant are required, both in the application and letters of competency provided in support of their abilities as a repair technician:

- a) stipulating the length of time connected with the aircraft industry on Construction/ Modification / Overhaul duties,
- b) specifying the makes and models on which satisfactory work has been done.

- (e) **Completed Air Mechanic’s trade certificate applications are sent by the applicant to the Provincial Trade Board apprenticeship office which will schedule their testing. Upon satisfactory completion of the Provincial Trade’s written, oral and practical tests the Provincial Trades Board will issue a mechanic’s certificate of competency to the applicant.**

- k) Air Mechanics wishing to upgrade their trade credentials may, from time to time after obtaining the required theoretical education and practical experience, request to be examined by their Provincial Trades Board on additional types of maintenance / repair work, and if the examinations are satisfactorily passed, their Certificate will be endorsed accordingly. Such

examinations may be either oral, practical, written, or all of the above, dependent upon the qualification sought.

- I) When queries arise as to the Competency of an Air Mechanic's skills / abilities / capabilities they may be required to be re-tested by their Provincial / Territorial Trades' Board, or by the Trades Board having oversight of trades-persons within the Province or Territory in which they are working. Failure of these tests will result in suspension of their Air Mechanic's certificate of competency until such time as they successfully pass the test(s) they failed to master.

m) APPLICATIONS FOR Air Engineers' Licenses

- (a) Application forms may be obtained on request from
 - a) Civil Aviation Inspectors at the various District offices, or from
 - b) the Civil Aviation Division, Department of Transport, Ottawa.
 - (b) Applications for Air Engineer Licenses cannot be considered unless sufficient information is given in either the application or letters of competency concerning the candidate's knowledge and experience accomplishing inspection / certification work on different makes and models of aircraft, aero engines and accessories.
 - (c) For an A or C license applicant, complete details of the applicant are required, both in the application and letters of competency as inspector / certifier:
 - a) stipulating the length of time connected with the aircraft industry on maintenance duties,
 - b) specifying the makes and models on which satisfactory work has been done.
 - (d) For a B or D license applicant, complete details of the applicant are required, both in the application and letters of competency as inspector / certifier:
 - a) stipulating the length of time connected with the aircraft industry on Construction/ Modification / Overhaul duties,
 - b) specifying the makes and models on which satisfactory work has been done.
 - (e) **Completed Applications are sent to:**
 - a) Civil Aviation Inspectors at the various District offices, or from
 - b) the Civil Aviation Division, Department of Transport, Ottawa
- n) Air Engineers may, from time to time, request to be examined on additional airframe and/or engine types, and if the examination is satisfactorily passed, their License will be endorsed accordingly. Such examinations may be either oral, practical, written, or all of the above, dependent upon the qualification sought.
- o) When queries arise as to the Competency of an Air Engineer's skills / abilities / capabilities as an inspector / certifier they may be required to be re-tested to determine their competency as such. Failure of these tests will result in suspension of their Air Engineer's License until such time as they successfully pass the test(s) they failed to master.

p) Air Mechanic Qualifying Examinations - Ttheyoretical

(a) Category "A" : Daily Inspection of Aircraft / airframes before flight

Applicants must be familiar with the general principles of the systematic maintenance and examination of aircraft before flight, including knowledge of:

1. The correct assembly of components, , the erection of an aircraft, the rigging of an aircraft, the functioning of the flying controls, togettheyr with the correction of faults experienced during flight, the correct assembly and functioning of the landing gear including the correct rigging of skis, and the method of erection, truing up and maintenance of hulls and floats of wood, metal, or composite construction.
2. The defects and deterioration in wing coverings, timber and metal members, metal fittings, airscrews (wood or metal), streamline wires, tie-rods, cables, shock absorbing devices and the parts of the aircraft structure that may be expected to occur as the result of wear and tear, or may be produced by slight mishaps experienced during normal operations of the aircraft, and a knowledge of the method of effecting minor repairs and replacements.
3. The method of inspecting and testing the installation of the flying instruments to ensure correct functioning.
4. Compass adjustment, turn indicator, and electrical services, the method of inspecting and testing of the installation concerned in order to ensure correct functioning.
5. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
6. The entries which must be made in the appropriate log book, and ability to select data and to make the suitable entries to provide a useful history of the aircraft.
7. Air Regulations in so far as they affect Air Engineers.

(b) Category "B"- Inspection of Aircraft/ airframes after Overhaul, Major Repair, Major Modification.

The applicant must be familiar with the general principles of the inspection of aircraft construction. including knowledge of:

1. Non-Metallic materials and their relative specifications;
2. methods of identification, examination and testing;
3. characteristic defects which render them unsuitable and precautions to be observed in their application to aircraft construction.
4. Metallic materials and their relative specifications, methods of identification, examination and testing; characteristic defects which render them unsuitable and precautions to be observed during processes of manufacture or repair-{heat treatment, welding, brazing, soldering, plating, etc.).
5. The method of construction and examination of hulls and floats; effects of corrosion, causes of corrosion and protection against corrosion.
6. The method of construction, examination and testing of aircraft parts and components-(fuselages, wings, airscrews, tanks, radiators, pumps, cocks, etc.) corrosion and its prevention. The high tensile steels, strong aluminum alloys, etc., and the special workshop processes applicable to the materials m;ed in the particular construction or constructions.
7. Method of inspecting and testing the complete aircraft for correct assembly, installation of engine, controls, fuel, oil and water systems, cabin heaters, instruments, electrical services and the appliances.
8. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
9. The entries which must be made in the appropriate log book, and ability to select data and to make the suitable entries to provide a useful history of the aircraft.
10. Air Regulations in so far as they affect Air Engineers.

(c) Category "C": Daily Inspection of Aero Engines before flight

The applicant must be familiar with the general principles of inspection and testing of aero engine installation and maintenance, including knowledge of:-

1. The general construction of the particular type or types of engine for which the Certificate is required, togettheyr with the running time permissible before overhaul; the method and details of making a partial

overhaul for the purpose of carbon removal, valve grinding and inspection, the defects likely to be encountered and the permissible allowances for wear and distortion; the methods of inspection and testing during and after this operation to ensure correct assembly and functioning.

2. The methods of examining and testing the correct erection of the power plant and its accessories in the aircraft, including the fuel, oil, cooling, ignition, induction and exhaust systems, tanks, pipe lines, engine controls, airscrew complete with hub, together with characteristic defects.
3. The inspection, adjustment and testing of the power plant and its accessories to ensure correct functioning and power output after installation in the aircraft and during daily maintenance, including airscrews, magnetos, Carburettors, pumps, filters, engine starters and starting mechanisms and the parts or components on whose condition the correct functioning of the power plant depends;
4. causes, effect, and prevention of external and internal corrosion.
5. The correct grades of oil and the lubricants approved by the engine manufacturer for use on the particular engine or engines and their seasonal application; periods of running between oil changing.
6. The minimum requirements for the fuel as specified or recommended by the engine manufacturer.
7. The methods of inspecting and testing the installation of the instruments connected with the power plant concerned to ensure correct functioning, including pressure gauges, temperature and revolution indicators, boost gauges and tank contents gauges.
8. The method or methods of starting engines in sub-zero temperatures, including precautions to be taken to minimize the risk of fire, when naked flames are used during this operation.
9. For certificate to include supercharged engines, the functioning of superchargers and boost control.
10. For certificate to include Compression Ignition Engines; the fuel injection system and method of regulation.
11. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
12. The entries which must be made in the appropriate log book, and ability to select data for and to make the suitable entries to provide a useful history of the engine.
13. Air Regulations in so far as they affect Air Engineers.

(d) **Category "D": Inspection of Aero Engines after complete overhaul**

The applicant must be familiar with the general principles of the inspection of aero engines during construction and/or complete overhaul including knowledge of-

1. **Materials :**
 - a. Materials used in engine construction and their relative specifications,
 - b. methods of identification, re-examination and testing.
 - c. Characteristic defects which render them unsuitable and
 - d. precautions to be observed during processes of manufacture and repair: heat treatment, white metalling, etching, brazing, soldering,
 - e. protection against corrosion, etc.-to ensure that the finished parts are in a satisfactory condition.
2. **testing and measurement**
 - a. The general principles of testing and measurement of horse power, fuel and oil consumption, etc., as applied to aero engines.
3. The correct grades of oil and the lubricants approved by the engine manufacturer for use on the particular engine or engines and their seasonal application; periods of running between "oil changing";
4. characteristic defects resulting from incorrect or insufficient lubrication;
5. cause and effect of sludge formation.
6. The minimum requirements for the fuel as specified or recommended by the engine manufacturer.
7. The general assembly, adjustment and methods of testing the correct erection of the components of the particular type or types of aero engine for which the certificate is required~ including the safe allowances for deterioration, wear, distortion, balancing of parts, etc.

8. The methods of adjustment, repair and testing of carburetors, engine starters, pumps, etc., that are fitted to the particular type of engine .and of minor repairs to, .and adjustment of, magnetos.
9. Causes, effects and prevention of external and internal corrosion.
10. Protection against corrosion during storage.
11. The methods of inspecting and ctheycking the correct functioning of the ignition, carburation, lubrication and cooling systems on the engine during tuning up and testing.
12. For certificates to include supercharged engines, the method of construction, testing and functioning of the supercharger unit and its accessories.
13. For certificates to include Compression Ignition Engines, the construction of the Fuel Injection System and the methods of fuel regulation.
14. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
15. Entries which must be made in the appropriate log book, and ability to select data for and to make the suitable entries to provide a useful history of the engine.
16. Air Regulations in so far as they affect Air Engineers.

q) PRACTICAL TEST – Air Mechanics - ALL Categories

(a) Tools and Materials:

- a) An Air Engineer in the performance of his duties may and often will be required to execute various repairs and replacements, for which a certain amount of skill in the manipulation of materials and the use of hand tools is necessary.
- b) Candidates must satisfy the examiner that they possess the required skill for this work and may be required to demonstrate this fact by actual tests. These tests will be confined to simple operations as:-
 - a. Use of files and scrapers.
 - b. Use of measuring instruments.
 - c. Marking off and drilling, to drawing.
 - d. Bending of stheyet metal and tube.
 - e. Solder ing and brazing.
 - f. Use of carpenter's hand tools.
 - g. Prepar ation and use of casein cement.
 - h. Sewing of fabric
 - i. Splicing of control cables.
 - j. Riveting.
 - k. Fitting of Piston Rings.
 - l. Valve grinding, etc.

r) Air Engineer Qualifying Examinations - Theoretical

(a) Category "A" : Daily Inspection of Aircraft / airframes before flight

Applicants must be familiar with the general principles of the systematic maintenance and examination of aircraft before flight, including knowledge of:-

8. The method of checking the correct assembly of components, the rigging of an erected aircraft and the functioning of the flying controls, together with the correction of faults experienced during flight, the assembly and functioning of the landing gear including the correct rigging of skis, and the method of erection, truing up and maintenance of hulls and floats of wood, metal, or composite construction.
9. The defects and deterioration in wing coverings, timber and metal members, metal fittings, airscrews (wood or metal), streamline wires, tie-rods, cables, shock absorbing devices and the parts of the aircraft structure that may be expected to occur as the result of wear and tear, or may be produced by slight mishaps experienced during normal operations of the aircraft, and a knowledge of the method of effecting minor repairs and replacements.
10. The method of inspecting and testing the installation of the flying instruments to ensure correct functioning.
11. Compass adjustment, turn indicator, and electrical services, the method of inspecting and testing of the installation concerned in order to ensure correct functioning.
12. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
13. The entries which must be made in the appropriate log book, and ability to select data and to make the suitable entries to provide a useful history of the aircraft.
14. Air Regulations in so far as they affect Air Engineers.

(b) Category "B"- Inspection of Aircraft/ airframes after Overhaul, Major Repair, Major Modification.

The applicant must be familiar with the general principles of the inspection of aircraft construction. including knowledge of:-

11. Non-Metallic materials and their relative specifications;
12. methods of identification, examination and testing;
13. characteristic defects which render them unsuitable and precautions to be observed in their application to aircraft construction.
14. Metallic materials and their relative specifications, methods of identification, examination and testing; characteristic defects which render them unsuitable and precautions to be observed during processes of manufacture or repair-(heat treatment, welding, brazing, soldering, plating, etc.).
15. The method of construction and examination of hulls and floats; effects of corrosion, causes of corrosion and protection against corrosion.
16. The method of construction, examination and testing of aircraft parts and components-(fuselages, wings, airscrews, tanks, radiators, pumps, cocks, etc.) corrosion and its prevention. The high tensile steels, strong aluminum alloys, etc., and the special workshop processes applicable to the materials used in the particular construction or constructions.
17. Method of inspecting and testing the complete aircraft for correct assembly, installation of engine, controls, fuel, oil and water systems, cabin heaters, instruments, electrical services and the appliances.
18. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
19. The entries which must be made in the appropriate log book, and ability to select data and to make the suitable entries to provide a useful history of the aircraft.
20. Air Regulations in so far as they affect Air Engineers.

(c) Category "C": Daily Inspection of Aero Engines before flight

The applicant must be familiar with the general principles of inspection and testing of aero engine installation and maintenance, including knowledge of:

14. The general construction of the particular type or types of engine for which the Certificate is required, together with the running time permissible before overhaul; the method and details of making a partial

overhaul for the purpose of carbon removal, valve grinding and inspection, the defects likely to be encountered and the permissible allowances for wear and distortion; the methods of inspection and testing during and after this operation to ensure correct assembly and functioning.

15. The methods of examining and testing the correct erection of the power plant and its accessories in the aircraft, including the fuel, oil, cooling, ignition, induction and exhaust systems, tanks, pipe lines, engine controls, airscrew complete with hub, together with characteristic defects.
16. The inspection, adjustment and testing of the power plant and its accessories to ensure correct functioning and power output after installation in the aircraft and during daily maintenance, including airscrews, magnetos, Carburettors, pumps, filters, engine starters and starting mechanisms and the parts or components on whose condition the correct functioning of the power plant depends;
17. causes, effect, and prevention of external and internal corrosion.
18. The correct grades of oil and the lubricants approved by the engine manufacturer for use on the particular engine or engines and their seasonal application; periods of running between oil changing.
19. The minimum requirements for the fuel as specified or recommended by the engine manufacturer.
20. The methods of inspecting and testing the installation of the instruments connected with the power plant concerned to ensure correct functioning, including pressure gauges, temperature and revolution indicators, boost gauges and tank contents gauges.
21. The method or methods of starting engines in sub-zero temperatures, including precautions to be taken to minimize the risk of fire, when naked flames are used during this operation.
22. For certificate to include supercharged engines, the functioning of superchargers and boost control.
23. For certificate to include Compression Ignition Engines; the fuel injection system and method of regulation.
24. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
25. The entries which must be made in the appropriate log book, and ability to select data for and to make the suitable entries to provide a useful history of the engine.
26. Air Regulations in so far as they affect Air Engineers.

(d) **Category "D" : Inspection of Aero Engines after complete overhaul**

The applicant must be familiar with the general principles of the inspection of aero engines during construction and/or complete overhaul including knowledge of:

17. Materials :

- a. Materials used in engine construction and their relative specifications,
- b. methods of identification, re-examination and testing.
- c. Characteristic defects which render them unsuitable and
- d. precautions to be observed during processes of manufacture and repair: heat treatment, white metalling, etching, brazing, soldering,
- e. protection against corrosion, etc.-to ensure that the finished parts are in a satisfactory condition.

18. testing and measurement

- a. The general principles of testing and measurement of horse power, fuel and oil consumption, etc., as applied to aero engines.
19. The correct grades of oil and the lubricants approved by the engine manufacturer for use on the particular engine or engines and their seasonal application;
20. periods of running between "oil changing";
21. characteristic defects resulting from incorrect or insufficient lubrication;
22. cause and effect of sludge formation.
23. The minimum requirements for the fuel as specified or recommended by the engine manufacturer.
24. The general assembly, adjustment and methods of testing the correct erection of the components of the particular type or types of aero engine for which the certificate is required~ including the safe allowances for deterioration, wear, distortion, balancing of parts, etc.

25. The methods of adjustment, repair and testing of carburetors, engine starters, pumps, etc., that are fitted to the particular type of engine .and of minor repairs to, .and adjustment of, magnetos.
26. Causes, effects and prevention of external and internal corrosion.
27. Protection against corrosion during storage.
28. The methods of inspecting and ctheycking the correct functioning of the ignition, carburation, lubrication and cooling systems on the engine during tuning up and testing.
29. For certificates to include supercharged engines, the method of construction, testing and functioning of the supercharger unit and its accessories.
30. For certificates to include Compression Ignition Engines, the construction of the Fuel Injection System and the methods of fuel regulation.
31. All applicable modifications contained in Technical Information Circulars issued by the Controller of Civil Aviation.
32. Entries which must be made in the appropriate log book, and ability to select data for and to make the suitable entries to provide a useful history of the engine.
33. Air Regulations in so far as they affect Air Engineers.

PRACTICAL TESTS – Air Engineers - ALL Categories***Use of Tools and Materials:***

An Air Engineer in the performance of their duties may, and often will, be required to execute various repairs and replacements themselves, for which a certain amount of skill in the manipulation of materials and the use of hand tools is necessary. Candidate Air Engineers must satisfy the examiner that they possess the required skill for this work and may be required to demonstrate their abilities by actual tests. These tests may or may not be confined to simple operations such as:

- a. Use of files and scrapers.
- b. Use of measuring instruments.
- c. Marking off and drilling, to the design drawing specification.
- d. Bending of sheet metal and tube.
- e. Soldering and brazing.
- f. Use of carpenter's hand tools.
- g. Preparation and use of casein cement.
- h. Sewing of fabric
- i. Splicing of control cables.
- j. Riveting.
- k. Fitting of Piston Rings.
- l. Valve grinding, etc.

Authority of the Air Engineers' License
Air Engineer Category "A"

Air Engineer's Certificate, Category "A" authorizes the holder, after personally accomplishing an adequate inspection, to "certify as airworthy":

1. any of the types of aircraft endorsed on his certificate, provided:
 - a) That the annual Certificate of Airworthiness for the particular aircraft is in good standing.
 - b) That they are satisfied that the aircraft is airworthy at the time they record this fact in the aircraft log book.
2. any minor repairs and replacements which become necessary to these types of aircraft as the result of normal use.

NOTE of Caution:

"Minor repairs and replacements" are defined as:

"those repairs and replacements which do not affect the strength of the main structural members of the aircraft, **except that** these main structural members may be replaced only by replacing the complete assembly in which they may occur" - in which case the repair / replacement of the assembly must have been duly certified as airworthy by an air engineer holding the appropriate certificate (i.e. "B" for Airframe, "D" for Engine).

A spar is a main structural member and forms an integral part of a main assembly. The repair or replacement of a spar must be certified by an air engineer licensed in Category "B."

A longeron forms an integral part of the fuselage and the same rule applies to replacement of these components and their certification by an air engineer licensed in Category "B."

An air engineer, Category "A," may certify the aircraft as airworthy after the satisfactory replacement of the now certified complete assembly containing either a Spar or Longeron.

Air Engineer Category "B"

An Air Engineer, Category "B," is authorized to "certify as airworthy", after major repair or complete overhaul, any of the aircraft endorsed on his Certificate provided:

1. That the aircraft conforms to the type for which the original Certificate of Airworthiness was issued, with the exception of such modifications as may have been ordered by the Minister in Technical Information Circulars issued by the Controller of Civil Aviation or otherwise approved.
2. That they are satisfied by adequate and personal inspection that:
 - a. the strength of the repaired component or components is similar to the strength of the same components when in the new state, and
 - b. that such repaired components or replacements conform to the approved drawings in material and dimensions, except:
 - i. That damaged portions of welded steel tube fuselages and of the components of similar construction may be replaced provided that the location and design of the welds conform to established practice for the type of repair, and,
 - ii. That the original metallurgical structure of the material has been restored by suitable heat treatment in those components on which heat treatment is a requirement during manufacture, and
 - iii. That repairs to the forms of construction are similarly in accordance with established practice, and
 - iv. That repairs to spars and the components as may be specifically directed by Technical Information Circulars conform to sketches or drawings which have been submitted to the Minister and approved by the Minister for each repair.
3. That they are satisfied by adequate and personal inspection that:
 - a. the aircraft has been assembled correctly including the installation or insertion of all necessary locking devices required to prevent the accidental separation of any of the components, and
 - b. that the method of protection used against deterioration is reasonable for the purpose, bearing in mind the particular conditions under which the aircraft is required or expected to operate.

Air Engineer Category "C"

Air Engineers licensed in Category "C" are authorized to

1. certify as airworthy any of the types of aircraft engines endorsed in their License provided:

- a. That no modifications to such engines have been made, except:
 - i. as directed by the Minister in Technical Information Circulars, or
 - ii. unless otherwise approved.
 - b. That they are satisfied by adequate personal inspection that the engine is airworthy at the time they record this fact in the appropriate log book.
2. In addition, an *Air Engineers licensed in Category "C"* authorizes the holder, after adequate personal inspection, to certify as airworthy all:
- a. minor repairs,
 - b. minor replacements and
 - c. minor adjustments
- which may be required to the engine:
- i. as a result of normal operation, or
 - ii. which become apparent during partial overhaul.
- Partial overhaul is defined as:
- a) Removal of cylinders and attached valve gears for the purpose of carbon removal,
 - b) valve reseating,
 - c) general inspection not requiring the complete dismantling of the engine.
 - d) Removal of accessory units for examination, adjustment or repair.

Air Engineer Category "D"

An Air Engineer licensed in Category "D" is authorized to:

1. certify as airworthy, after major repairs and/or complete overhaul any engines of the types endorsed on his certificate, provided:
 - a. That replacement parts conform in all respects to the manufacturer's approved drawings for such parts.
 - b. That reasonable precautions against failure of any part has been taken by means of adequate inspection.
 - c. That no modifications have been made or added except as ordered by the Minister in Technical Information Circulars, or otherwise approved by him.
 - d. That they are satisfied by adequate and personal inspection, that the engine has been correctly assembled including the installation or insertion of all necessary locking devices as will prevent the accidental separation or derangement of any of the components.
 - e. That the satisfactory functioning of the assembled engine and its essential accessories has been proved by adequate ground test.
 - f. That the protection against deterioration is reasonable having in mind the particular conditions under which the engine is required or expected to operate.

This list of "Authorizations" does not imply that all repairs to aircraft or engine must be accomplished by an Air Engineer. It is permissible for the actual work required for preparing an aircraft or engine for certification to be carried out by a suitably certified competent mechanic, except the result of the mechanic's work must be certified by an Air Engineer holding a License in the appropriate category, before the aircraft can be accepted as airworthy.

ALL Licensed Air Engineers' are entrusted to mentor/ guide / coach certificated Air Mechanics wishing to become Licensed Air Engineers (henceforth known as "Apprentice Air Engineer" or "Candidate Air Engineer") to ensure the person knowingly and willingly serves an apprenticeship as a junior Inspector / Certifier while learning to understand the role and responsibility of the Licensed Air Engineer and ultimately performing the same Government Administrative tasks as a Licensed Air Engineer in order to be deemed competent to undertake their Federal Government tests to be issued an Air Engineer's License.

PERIOD OF VALIDITY

a) Air Mechanic Certificates Of Competency:

- a) are issued for a period of ten (10) years.
- b) **Are kept valid by the Provincial Trades Board thru periodic**
 - a. **information updates,**
 - b. **trades-show attendance,**
 - c. **Skill development sessions**

b) Air Engineer Licenses

- a) are issued for a period of three (3) years.

- b) **Are kept valid by the Federal Government thru periodic**
 - a. **information updates,**
 - b. **Professional Development seminar attendance,**
 - c. **Skill development sessions**

RENEWALS

c) of Air Mechanic Certificates Of Competency:

- a) Applicants for renewal / update / etc of Air Mechanic Certificates of CompetencyPLACEHOLDER

d) of Air Engineer Licenses

- a) Applicants for renewal of **Air Engineer License** must produce proof to the examining official that:
 - a. they are in possession of a copy of all current Technical Information Circulars, and
 - b. that they are familiar with the material within them.
- b) Technical Circulars bear a serialized number prefixed by the letter "T" thus T/12, T /17, T/34, etc.
- c) Missing current Technical Information Circulars may be obtained from the Department of Transport on request.
- d) Applicants must state the serial number of the last Technical Information Circular received by them.
- e) **Air Engineer Licenses** are normally renewed for a period of three years.

Appendix E : Response from the DGCA

www.tc.gc.ca 03-0418 (1307-02)

UNCLASSIFIED / NON CLASSIFIÉ

Your file Votre référence

Our file Notre référence

XAN-2021-505163

RDIMS Number Numéro de SGDDI

RDIMS # 18138501

Mr. Tony Soulis

President

Soulis & Associates

tonysoulis@gmail.com

Mr. Steve Chamberlain

sy.flightdeck@gmail.com

Dear Mr. Soulis and Mr. Chamberlain:

I am writing in response to your correspondence of October 17 and 18, 2021, to the Honourable Omar Alghabra, Minister of Transport, regarding ground engineer and aircraft maintenance engineer licences.

A safe and secure transportation system is the most important mandate of Transport Canada Civil Aviation (TCCA).

The suggestion that the Aircraft Maintenance Engineer (AME) licence has been “eroded” and that the maintenance of Canadian aircraft has “compromised” the safety of the flying public is a statement that we take very seriously.

A recent review of available data on aviation safety shows the opposite trend is taking place.

According to a recent Air Transportation Occurrences report published by the Transportation Safety Board (TSB), there has been consistent improvement in aviation safety and a yearly average decrease in aviation accidents and fatalities over the past decade.

In a safety issue investigation report released in 2019 titled “Raising the bar on safety: Reducing the risks associated with air-taxi operations in Canada,” the TSB **identified the air taxi sector as having more accidents and fatalities than all other sectors of commercial aviation in Canada.**

The investigation spanned **from 2000– 2017** and **showed that 14% of the occurrences were maintenance related;**

however, **none of the hazards and risk factors identified in the report were associated with the current AME licensing requirements.**

The current AME licensing requirements were implemented in 1999 and have been subject to very few changes since their implementation.

The requirements in Subpart 403 of the Canadian Aviation Regulations, and Chapter 566 **of the Airworthiness Manual (AWM)**, continue to be aligned with the International Civil Aviation Organization’s Annex 1 – Personnel Licensing requirements, and in fact **exceed these requirements, as** all AME licensing applicants must have completed basic training.

There is no correlation to suggest that "safety is being compromised due to the implementation of the current AME licensing system".

Obtaining an AME licence is a rigorous process.

Regardless of :

1. an applicant’s previous experience in aircraft maintenance, or
2. if a foreign licence is held,

all applicants for initial issuance of an AME licence are required to meet the same conditions of issuance.

Conversion of an aircraft maintenance licence obtained from other foreign civil aviation authorities into a Canadian AME licence is strictly prohibited.

Because of this, it is not possible to obtain an AME licence simply by providing proof of holding another aircraft maintenance licence, such as a Federal Aviation Administration (FAA) Airframe & Powerplant mechanic certificate.

TCCA continues to support AME licence holders and applicants through:

1. various symposiums and conferences we attend,
2. by providing training and updates to our regulatory framework.

TCCA meets annually with AME licence and training associations such as:

1. AMEs of Canada (AMEC), representing numerous provincial AME associations and licence holders, as well as the National Training Association, which represents all the AME basic training Approved Training Organizations in Canada.

In 2022–23, TCCA will be working with these associations, along with key stakeholders, to update the AME basic training curriculum subjects currently contained in AWM Chapter 566.

This work will help modernize the AME curriculum and ensure inclusion of the latest technologies to prepare future AME licence holders for employment in the Canadian aviation industry.

It is important to also point out that a Canadian AME licence holder **is not considered equivalent to an FAA Designated Airworthiness Representative**, as

this FAA delegation is similar to the TCCA Minister's Delegate (MD) delegation, which replaced the TCCA Airworthiness Inspection Representative (AIR) delegation in 1999.

Also, **this previous TCCA AIR delegation was not the same as the current TCCA Design Approval Representative (DAR) delegation.**

A DAR is delegated under AWM Chapter 505, Subchapter C, and may perform the airworthiness engineering functions set out in their approved Engineering Procedures Manual.

A TCCA DAR "does not hold the privileges associated with an AME licence" or those of the MD delegation.

As far as "forming a committee to review the current licensing system", as previously stated,

the current licensing system has been in place "since 1999", **and "TCCA is of the opinion" that Canadian AME licence holders "have greatly contributed to the increase in aviation safety" of the flying public and to the decline of aviation occurrences.**

Based on this, TCCA believes that the AME licensing system currently in place has not been eroded.

Thank you for sharing your thoughts with Transport Canada.
Sincerely,

Nicholas Robinson, Director General, Civil Aviation
c.c.

Office of the Honourable David Lametti, P.C., M.P.
Minister of Justice and Attorney General of Canada

Appendix F : Response to the DGCA's reply

From: **Steve Chamberlain** <sy.flightdeck@gmail.com>

to: "Robinson, Nicholas" <Nicholas.Robinson@tc.gc.ca>, "Minister of Transport / Ministre des Transports (TC)" <TC.MinisterofTransport-MinistredesTransports.TC@tc.gc.ca>

cc: "David.Lametti@parl.gc.ca" <David.Lametti@parl.gc.ca>, marco.mendicino@parl.gc.ca, terry.dowdall@parl.gc.ca, melissa.lantsman@parl.gc.ca, racquel.dancho@parl.gc.ca, Roger Beebe
Tony Soulis

date: **2 Feb 2022**, 15:35

subject: Re: Aircraft Maintenance Engineer Licensing - Some information from the UK Circa 1949 (XAN-2021-505163)

Good afternoon Mr. Robinson,

Thank you for your response, my apologies for my tardy reply.

I have a couple of questions to ask and some points to note.

Did you read the full TSB report to which you refer? Although the report says that there is a decline in the number of accidents, there is no decline in the number of fatalities, that the number of operators has decreased and that there are concerns over how data is reported as well as what data is reported.

The TSB report is largely focused upon flight operations with maintenance being incidental. Did you take note that the TSB report identifies concerns from not only Industry but also from the TSB regarding AMEs? Particularly section 4.2.2 "Safety theme: Availability of qualified Personnel" and onwards?

Although you may have been presented with one point of view from persons within Transport Canada regarding AMEs when you responded to the emails sent originally as a CC to the Minister of Transport, there is an entirely unrecognised (today) amount of documentation that should be fully and substantially reviewed by the Minister of Transport as well as the Minister of Justice as it may help to deliver a clearer picture of what "the AME is" and "what their role in aviation safety and oversight control" is intended to be.

The concern is not that "Canadian Aviation isn't safe" but that the current TC stated program of AME training outcome, namely to produce a fully qualified Technician with the expectation that they can fulfill the duties and responsibilities of the AME is flawed. The two roles and responsibilities are contrasting and in many cases opposing.

At the time that the AME was originally introduced into Canadian legislation it was considered to be intrinsic to the "Control of Civil aviation" and the license was for persons accorded delegation as a representative of the Government to ensure that the Airworthiness and safety of aircraft was not compromised by the trades-persons accomplishing trades' work.

Prior to CARs, ANO, Series II, No. 4 - Order Respecting Conditions And Procedures For Keeping A Certificate of Airworthiness stated the following:

3. Every certificate of airworthiness issued in respect of an aircraft is issued on condition that the aircraft:

- a) will be maintained in accordance with a maintenance program that meets the aircraft standards of airworthiness established by the Minister pursuant to section 211 of the Air Regulations, and
- b) That an entry will be made in the Aircraft Journey Log of the aircraft by an authorized person (Air Engineer originally and an AME post WW1) , certifying that the aircraft is
 - 1) airworthy, or
 - 2) released for return to service,

whichever is applicable, at the times and in accordance with the procedures set out therefor in the Airworthiness Manual or in the Engineering and Inspection Manual.

Notwithstanding anything in ANO, Series II, No. 4 - Order Respecting Conditions And Procedures For Keeping A Certificate of Airworthiness, a certificate of airworthiness issued in

respect of an aircraft is NOT in force at any time when either of the conditions set out in paragraph 3(a) or (b) fails to be satisfied in respect of that aircraft.

What does this mean?

A certificate of airworthiness issued in respect of an aircraft is NOT in force when the aircraft is NOT maintained *in accordance with a maintenance program* that meets the aircraft standards of airworthiness established by the Minister pursuant to section 211 of the Air Regulations.

and

A certificate of airworthiness issued in respect of an aircraft is NOT in force when there is NO certification made by an AME in the Journey Log of the aircraft certifying that the aircraft is either:

- 1) airworthy, or
- 2) released for return to service.

It need not be stated that a certificate of airworthiness issued in respect of an aircraft is also NOT in force when the certification contained in the Journey Log of the aircraft certifying that the aircraft is either:

- 1) airworthy, or
- 2) released for return to service

was incorrectly attested to by the AME who certified the aircraft subsequent to inspecting the work that was performed to prepare it for certification.

Although Transport Canada has done exceptionally well at better defining the training of trade's-persons (AMTs) performing maintenance and repair work to prepare aircraft for inspection and subsequent certification it has apparently forgotten that nobody can be expected to fulfil the role of an AME (quality control supervisor, inspecting/certifying engineer or notary attesting to the completeness or accuracy of work/records of work) unless their training is specific to accomplishing the specific role that the AME license is issued for.

At present there is NO definition as to what specific separate subjects and focus areas each of these two areas of personnel performance are to be specifically trained and certified competent. Not to mention that the Federal Government may not actually be able to "Certify trades persons" under the terms of the BNA and no clear direction has ever been introduced into CARS that lays out how the Provinces should qualify and certify as competent "aviation trades-persons - AMTs" (But not AMEs) within their individual Provinces. Although some Provinces have established "Aviation trades certification" programs they are NOT Mandatory for accreditation in any way as an "Aviation Trades" competency requirement and the Provincial trades programs for AMTs are typically not identical when compared to each other - resulting in a "hit and miss" scenario of what their future employer may hire.

The TSB report that you included in your response was in part cause for accomplishing a CCAA review of the aviation trades in Canada that occurred this past year (I was a participating SME in the CCAA review) and it included include interviews from industry representatives who all point to a need to provide much better training in managerial and supervisory skills in AMTs as well as to ensure that the licensed AMEs know what they are doing when they sign and certify an aircraft due to "Issues" that are becoming increasingly prevalent and visible to those who commented and replied to the TSB and CCAA.

These views and issues regarding Work Performance errors made by the AMT's vs Aircraft inspection and certification errors made by Licensed AMEs are generally (and typically) not being reported outside of a company's SMS system and the company's tend to try and deal with the issues on their own - i.e without this data being reported directly to TC then TC may be blind to what is going on and may be assuming that everything is fine, resulting in a very long period of time elapsing before reviews are undertaken of Transport Canada guidance and direction on the training of aviation mechanics and of Aircraft maintenance Engineers - which should really be 2 different academic streams that deal with performing maintenance as one defined topic stream vs. supervision / quality control of trades' work and Inspection/ Certification / Notarising of the work records as a separate topic stream.

A note of concern regarding the "professional education of AMEs" is that AMEs are not presented during their initial or any other subsequent training with regard to the results and findings of legal cases and Civil Aviation Tribunals. These types of awareness sessions and education are used by other Professional groups to develop awareness of the higher level aspects of what the members are accomplishing. See attached CAT document # C-1631-04 as a typical example of what can be gleaned from such reports regarding AME roles / responsibilities and accountabilities, and misconceptions are documented to exist about AMEs.

Since 1999 the training delivered to AMEs in basic training programs is, by TC's own statement "intended to produce a fully qualified technician" however the focus of the trades-person tends to be less on "accountabilities and responsibilities of the AME as a license holder" and more on "I performed the maintenance and am signing that I did that work" - the emphasis has increasingly shifted from work inspector/certifier to that of work performer" and as there is only a single license issued and very little follow-up post licensing the new AME is left to integrate with a now massive group of people who now see the license as a "trades-persons" license allowing them to collect higher wages.

Additionally there may be influence by the trade-unions on new AMEs to further entrench their belief that the AME license is a trades' license which may in turn wind up being taught by some individuals in the college classrooms during basic AME training as well as subsequent aircraft type endorsement training - further detracting people from the actual intent of the license and intended role of the license holder.

The TSB report reflects issues with data reporting and collection.

Without the data being reported the management at TC may be running blind.

Considering that the bulk of the reporting is done by and for flight operations and that the maintenance/repair and inspection side is typically an afterthought by many companies there are perhaps some very large gaps that result in flawed assumptions that all is well.

Many companies try to deal with issues related to maintenance internally under their SMS policies and processes but - as noted when an OAS with Air Canada - Companies are generally not correlating and separating maintenance issues reported into their SMS programs to determine if they are directly related to:

- a) the company's specific work instructions, or
- b) if the issues were brought onboard as a result of what they were taught or otherwise learned as a candidate AME, or
- c) if the issue is part of an underlying aviation culture that permeates the industry at large.

Most companies do not use a system of SMS reporting that drills down into maintenance and certification issues such as Boeings' MEDA but instead will typically use a generic one-size-fits-all Service Difficulty reporting system based upon pilot/flight crew reporting forms/paperwork.

There is apparently an upcoming review by TC of CAR 566 training standards that may well be looked at in a different light after review of what I am attaching to this email.

Consider the following : from an AME head count reported June 30th, 2020 (TC Document # RDIMS 16673338) the number of AMEs in the Provinces were:

Yukon : 78 AMEs
 NWT : 123 AMEs
 Nunavut : 7 AMEs
 BC : 3613 AMEs
 AB : 2310 AMEs
 SK : 298 AMEs
 MB : 741 AMEs
 ON : 4523 AMEs
 QC : 2988 AMEs
 NB : 148 AMEs
 NS : 528 AMEs
 PEI : 20 AMEs
 Newfoundland and Labrador : 422 AMEs

Total AMEs active in Canada : **15804**

Of the total AMEs in Canada, 15368 are male and 428 are female. (this is an appalling % and shows that more work must be done to attract females to become AMEs)

Sadly due to COVID-19 those numbers of total AMEs in the provinces may have changed significantly as many AMEs retired or otherwise left the industry - this opens the doors to an influx of new, keen and eager persons who may not always stop and think "Safety First" before they sign a logbook. Certainly this issue of youthful exuberance and lack of experience is a well known issue and one that has resulted in incident and injury for many decades. Can Canada afford the risks associated with massive loss of experience coupled with massive influx of fresh personnel? Safety must come 1st.

Although you state in your documented response that TC delivers information to the AMEs via the National AME association, the National AME association does NOT cover ALL of the AMEs in Canada - in fact there is NO legislative requirement for AMEs to be registered practicing members of the National AME or any Provincial association.

The total membership of the Ontario AME association is under 600 members, for the Western Association it is under 300 and similar membership numbers are reflected for the other provincial associations.. In short, only a small fraction of the Total AMEs in Canada are actual registered members of an AME association

Additionally, the AMEs are spread across the vast expanse of the country and most will never attend the annual AME symposiums - as such the very notion that TC addresses concerns and updates ALL AMEs at these symposiums is a flawed assumption.

As a person with your extensive education and background would expect, a careful review of the materials should be accomplished by an impartial and independent panel of experts - that includes the very persons to which the review applies - the Minister of Transport's AMEs - before any refuting of information or factual evidence gets ruled out. That panel should then be allowed to report out its findings and determinations based on ALL available factual evidence and documentation. If they suggest or require changes be made then so be it, if they return with no findings and that there is no requirement to amend or revise what is currently being done then so be it. Either way a full and open review must be accomplished.

The records of the Governor-in-Council, the Privy Council, Senate and the Parliament of Canada all hopefully being accessible to the Minister of Justice should be reviewed extensively in order to allow the department of the Government that writes the law to compare what I am presenting to what is indeed recorded on the government's books. The resulting factual evidence needs to be shared with all parties concerned - no secrets should be kept.

I say this because some of what I have found may have never been presented to the Minister of Transport or the Minister's staff who were responsible for control of AME licensing and Airworthiness Inspection in the areas of Maintenance and Manufacturing in the past, and also those of the Minister of Transport's staff today who accomplish the same roles today who also may not have access to documentation that would allow them to accurately and completely fulfill their duties.

Ultimately the Minister of Transport - not the DGCA - is responsible for the training and certification not only of aviation trades-work performers but also the licensed AMEs who oversee and sign-off on all the trades-work accomplished to ensure airworthiness was not compromised by the maintenance work that was performed and that the aircraft is safe to fly.

Finally, in closing please note that **if there was no concern then the original emails** (in which the Minister of Transport was notified) **would have never been sent, however there are concerns and many experienced AMEs out there that feel they are valid, even if those AMEs do not take the time to email the Minister or otherwise notify the government.**

Not all documents can be attached to an email as there are thousands of them, however the ones attached need review by all who receive this email for their full consideration.

Thank you again Mr. Robinson for your response to the concerns being brought to light.

Kind regards,

Steve Chamberlain , AME